Volume XX.
Number 6.

JUNE, 1901.

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Including Directory.
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TEXTILE WORLD,

and Industrial Record.

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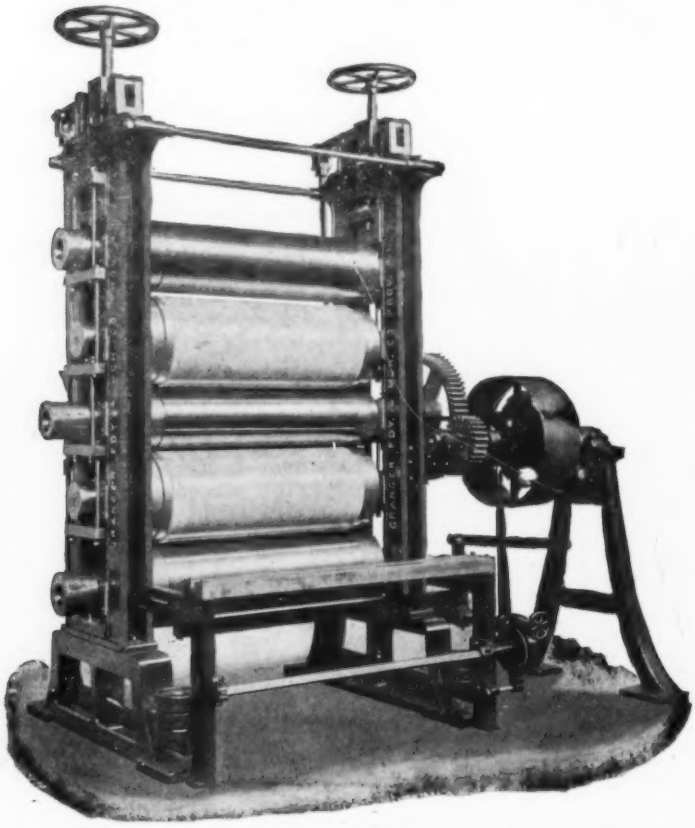
GUILD & LORD.
PUBLISHERS.

620 ATLANTIC AVENUE.
BOSTON, MASS.

Bleaching, Dyeing, Drying,

And Finishing Machinery.



CALENDERS, MANGLES AND ROLLS.

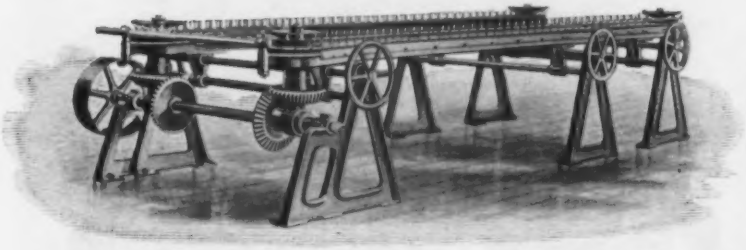
TENTERING MACHINES,
MERCERIZING MACHINES.

Granger Foundry and Machine Co.

PROVIDENCE, R. I.

Bleaching, Printing, Dyeing and Finishing Machinery

For Textile Fabrics.



STRAIGHT TENTERING MACHINE, WITH AUTOMATIC CLAMP. (Patented.)

TENTERING MACHINES.

VIBRATORY (or Swiss) MOTION FOR LAWNS, ETC.

RETURN (8, 10 or 12) returns FOR WORSTED AND WOOLEN GOODS.

HOT AIR (2 or 4 returns) FOR GINGHAMS, ETC.

AUTOMATIC CLAMPS (Patented). SPRING CLAMPS. PIN CHAINS.

H. W. BUTTERWORTH & SONS CO.,

PHILADELPHIA, PA.

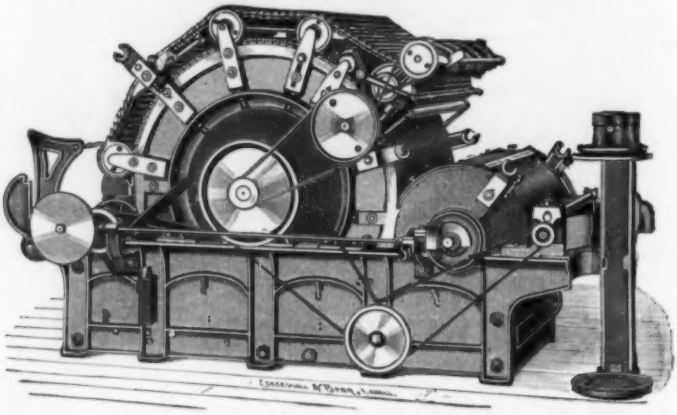
LOWELL MACHINE SHOP,

LOWELL, MASS.,

Builders of

COTTON MACHINERY

OF EVERY DESCRIPTION.



Revolving Flat Cards, Railway Heads,

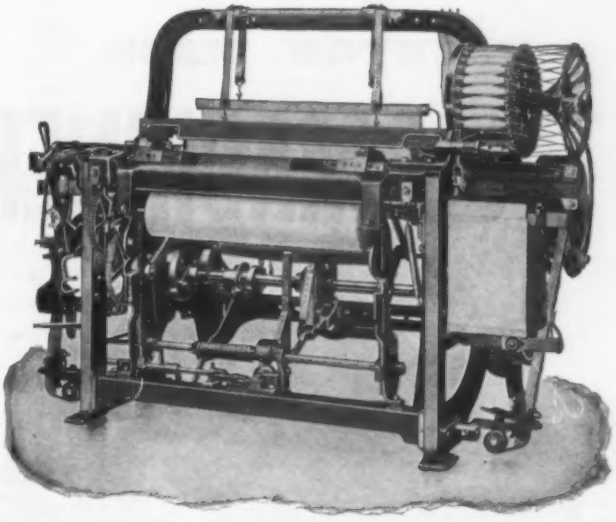
Ring Spinning Frames, Fly Frames,

Drawing Frames, Spoolers, Warpers,

Slashers, Looms.

Worsted Machinery.

ILLUSTRATED CATALOGUES SENT ON APPLICATION.



OUR LATEST

NORTHROP LOOM

Although our order list lengthens and strengthens, we do not adopt the simple and inexpensive plan of building without change, but continually add improvements whenever possible. A careful study of the above illustration will prove of interest to adepts in the Art of Weaving.

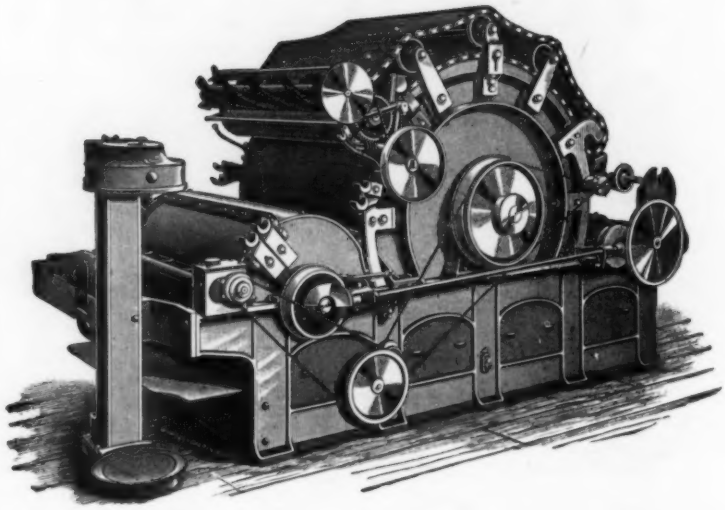
THE DRAPER COMPANY,

Hopedale, Mass.

MASON MACHINE WORKS,

TAUNTON, MASS.

COTTON MACHINERY



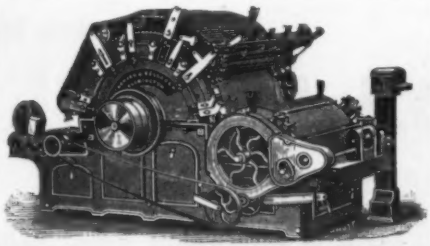
Cards, Combers, Lappers, Railway Heads, Drawing Frames, Spinning Frames, Mules and Looms,

INCLUDING THE

Mason-Northrop Loom.

SOUTHERN AGENCY:

D. A. TOMPKINS CO., Charlotte, N. C.



HOWARD & BULLOUGH

American Machine Company,

LIMITED,

PAWTUCKET, - R. I.

Boston Office, 281 Congress St.

Revolving Flat Cards.

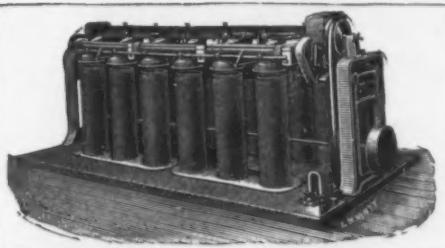
The Simplest and Most Accurate. Greatest Production. Best Quality. Least Waste.

OVER 16000 WORKING.

Electric Stop-Motion Drawing.

The quality of the sliver produced cannot be surpassed Waste, "single" and roller laps are prevented, production increased, and great saving effected.

OVER 56,000 IN OPERATION.



Bale Breakers. Feeders,

Combined Self-Feeding Openers,

Breaker and Finisher Lappers,

All made from entirely new patterns and containing many valuable patented improvements.

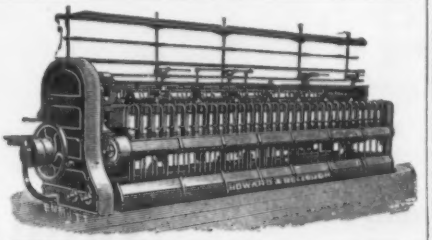
Slubbing, Intermediate, and Roving Machines.

New patented Differential motion, New Arrangement of Cone Drums, New System of Balancing top or bobbin rail, etc.

SPINNING FRAMES, CONE WINDERS,
TWISTERS, WARPERS AND SLASHERS.

All parts of above machines are made by special tools and are exact duplicates.

We Invite Investigation and Comparison.



THE WHITIN MACHINE WORKS,

Whitinsville, Mass.

COTTON MACHINERY

Revolving Flat Carding Engines.

Sliver Lap Machines.

Ribbon Lap Machines.

Combers.

Railway Heads.

Drawing Frames.

Spinning Frames.

Spoolers.

Twisters.

Reels

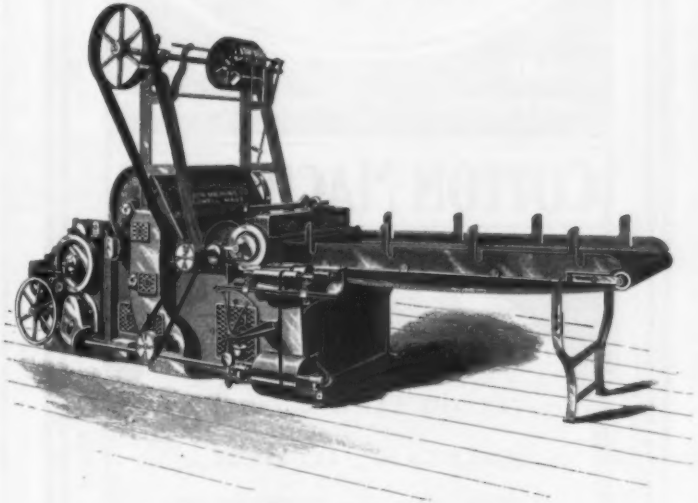
Long Chain Quilling Machines.

Looms.

Southern Agent, S. W. CRAMER, 38 So. Tryon St., Charlotte, N. C.

The Best Pickers.

In the Cotton Field nothing equals the
DARKY COTTON PICKER.



In the Cotton Mill nothing equals the
KITSON COTTON PICKERS.

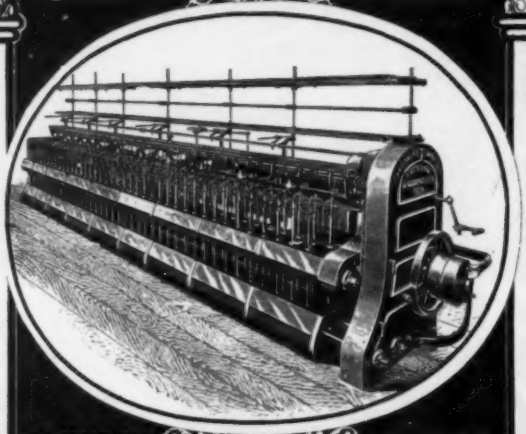
KITSON MACHINE CO., Lowell, Mass.

Largest Builders of Cotton Openers and Lappers in the World.

STUART W. CRAMER, Southern Agt., Charlotte, N. C.

H·G·McKERROW·&·CO·

DRAWING FRAMES · SPEED FRAMES
· CARDS · · MULES ·



COMBERS · · FLYERS ·
CARD CLOTHING · · WASTE MACHINERY

COTTON MACHINERY

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Sole American Agents for
TWEEDALES & SMALLEY,
Card Room Machinery.
TAYLOR LANG & CO. LTD.,
Self Acting Mules.
WILLIAM RYDER,
Flyers
C. CAIN, SON, & GREENWOOD,
Card Clothing of all Kinds
MONFORT'S COMBER.
Cotton Combers for
Short Staples

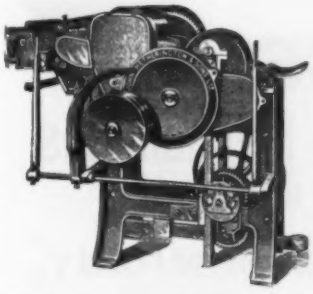
WORTHINGTON BLDG. 31 STATE ST., BOSTON MASS.

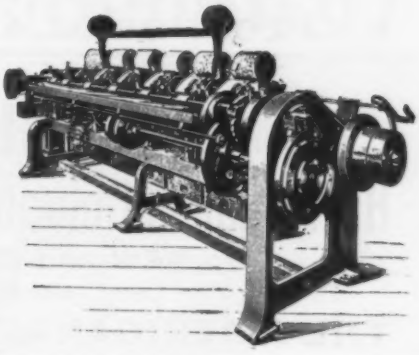
JOHN HETHERINGTON & SONS, LD.

Manchester: England,

——MAKERS OF ALL KINDS OF——

Machinery for Preparing, Spinning, Doubling Cottons, Cotton Waste, Woolen, Etc.

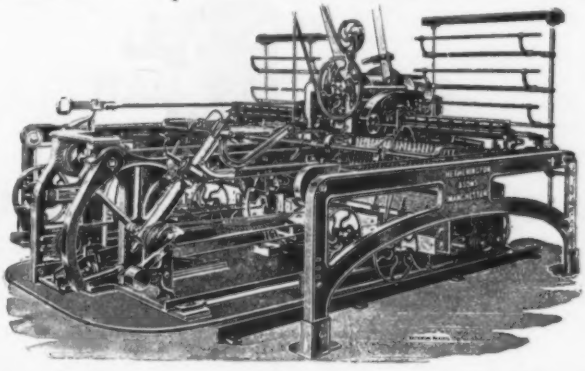




Sliver Lap Machines
with Self Acting Stop Motion.

Ribbon Lap Machines
with six Laps behind for preparing Laps for Combing Machines, made to suit any width of Laps required.

Combing Machines,
single and double Nip for six or eight heads, to take Laps from 7 1-2 in. to 10 1-2 in. wide. Patent Stop Motions for stopping Machine, when delivering too light Slivers, or after any required length has been delivered.



Patent Self Acting Mules (Hetherington and Curtis Patterns of Headstock) for coarse, medium and fine yarns.

Over Three Million Spindles at Work in the U. S.

SOLE IMPORTER FOR UNITED STATES AND CANADA.

STEPHEN C. LOWE, 41-42 BREWER BUILDING, 186 DEVONSHIRE ST. **Boston, Mass.**

"Nothing is either great or small except by comparison."

This accounts for the GREATNESS of the Picking Machinery built by

THE A. T. ATHERTON MACHINE CO., Pawtucket, R. I.

MANUFACTURERS OF

COTTON MACHINERY.

NOTICE.

Harriman Automatic Mechanisms

On NEW and OLD LOOMS.

Attached by

THE AMERICAN LOOM COMPANY,

READVILLE, MASS.

YOUR SPOOLING!

Improve the Quality.
Decrease the Cost.

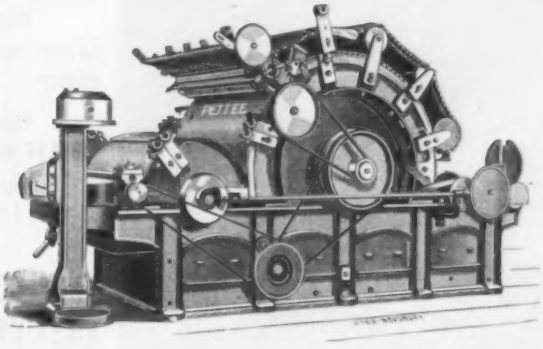
The Barber Knotter will do it. Can you afford to be without it?

BARBER & COLMAN. Room 1119, **11 Pemberton Sq.**
BOSTON, MASS.

Saco and Pettee Machine Shops,

Newton Upper Falls, Mass., U. S. A.

COTTON MACHINERY



PICKERS, SLUBBING,

REVOLVING FLAT CARDS,

INTERMEDIATE AND ROVING FRAMES,

RAILWAY HEADS,

DRAWING FRAMES,

SPINNING FRAMES, SPOOLERS.

SHOPS:

Biddeford, Maine.

Newton Upper Falls, Mass.

Southern Agent: A. H. WASHBURN, Charlotte, N. C.

THE DODGE MFG. CO.

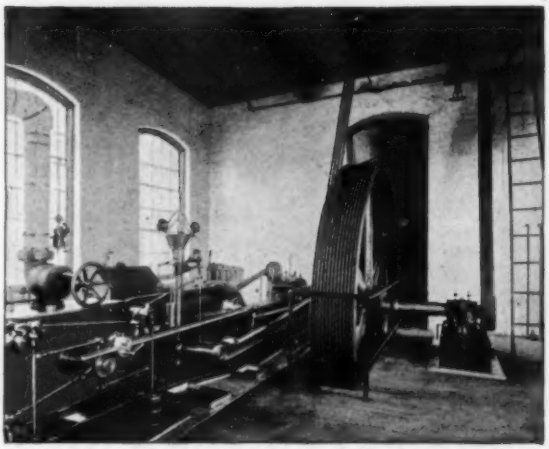
Engineers, Founders, Machinists,

MISHAWAKA, IND., U.S.A.

Branches:
BOSTON. NEW YORK. CHICAGO. CINCINNATI, ATLANTA, GA. LONDON, ENG.

DESIGNERS AND BUILDERS OF

Modern Textile Mill Equipments.



325 H. P. Rope Drive, Gwinnett Cotton Mills, Lawrenceville, Ga.

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LATEST IMPROVED DEVICES

Embodying
HIGHEST EFFICIENCY
In Power Transmission Engineering.

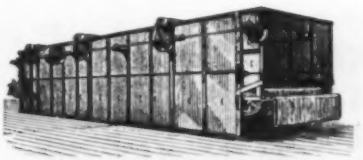
The "DODGE" AMERICAN SYSTEM ROPE TRANSMISSION.

CAPILLARY SELF-OILING BEARINGS—Oil Economizers.
IRON CENTER WOOD RIM TEXTILE PULLEYS—Designed especially for Textile Mill Work.
COUPLINGS—in variety.
SAFETY IRON CENTER WOOD RIM FLY WHEELS. IRON SPLIT AND SOLID PULLEYS, SHAFTING, ETC.

We have a large engineering force and will be pleased to assist you in the determining of your requirements in our line upon receipt of letter stating just what you desire to accomplish. Address nearest office.

Every Mill Man
Should Keep Posted by Reading
Power and Transmission
a unique publication in trade literature exclusively devoted to
MODERN POWER TRANSMISSION ENGINEERING
Copiously illustrated with typical installations. Other articles of interest to the up to date factory are also contained in each issue. Sample copy free by applying to
THE DODGE MANUFACTURING CO. ENGINEERS FOUNDERS MACHINISTS MISHAWAKA, IND. U.S.A.
BRANCHES ~ BOSTON NEW YORK CHICAGO CINCINNATI ATLANTA LONDON, ENG.

"CYCLONE" DRYERS



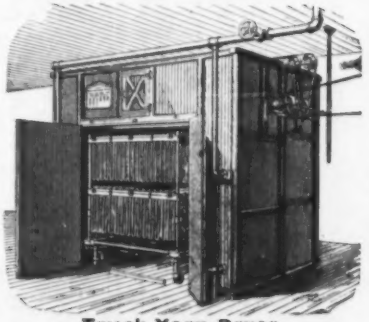
Automatic Yarn Dryer.

For Hosiery, Underwear, Yarn, Cotton Stock, Wool, etc.

CARBONIZING MACHINES,

YARN SCOURING MACHINES,

BREASTS, BURRING MACHINES



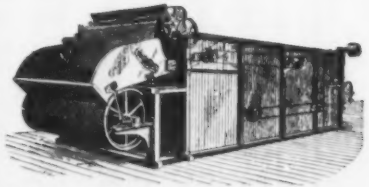
Truck Yarn Dryer.

FEED ROLLS, LICKERS-IN.

Phila. Textile Machinery Co,

Hancock and Somerset Sts.,

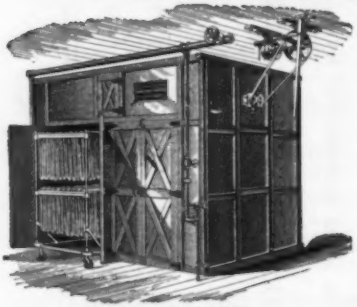
PHILADELPHIA, - PENN



Automatic Cotton Stock Dryer.

GARNETT MACHINES

"HURRICANE" DRYERS



TRUCK YARN DRYER.

— FOR —

WOOL, COTTON STOCK, YARN, STOCKINGS, UNDERWEAR, &c.

CARBONIZERS,

Yarn Scouring Machines.

"HURRICANE" FANS

for Ventilating and Drying.

Best in Construction. Lowest in Price.

Plans, Estimates and Catalogues cheerfully furnished.

PHILA. DRYING MACHINERY CO.,

6721 GERMANTOWN AVE., PHILADELPHIA, PA.

BLOCK CUTTING

For Fabric and Hosiery Printing.

We Design and make Printing Blocks in type metal, wood, copper, steel, or any material.

We manufacture our own rock maple Rollers and Blocks, and carry a large and well seasoned stock on hand.

Our Calico Stamps are executed by Manchester experts.

This is the largest establishment of its kind in the United States. Estimates cheerfully given. Orders filled rapidly.

SMITH & MEINKEN, 427 West 13th St., New York.

FAIRMOUNT MACHINE CO.

22ND & WOOD STS. PHILADELPHIA.

THE LATEST AND BEST LOOMS, DOBBIES, HARNESS MOTIONS

BEAMING, SPOOLING, WINDING, DYEING AND SIZING MACHINERY.

POWER TRANSMITTING MACHINERY.

FREIGHT ELEVATORS, PATENT FRICTION CLUTCHES.

"ALL SHEAVES LOOK ALIKE TO ME."

DO THEY?

JUST ASK US ABOUT OUR

Machine-Moulded Sheaves.

LINK-BELT MACHINERY CO., - Chicago.

Fabric Measuring and Packaging Co.

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Midnight Fast Black

„Amisilk"

Pickaninny Fast Black

OUR MACHINES PRINT TRADE MARKS

ON COTTONS, WOOLENS, CARPETS (Single and Double Widths.

We lease and license our machines to measure and imprint the measurement upon fabrics, fold the same lengthwise and roll into merchantable packages all in one operation.

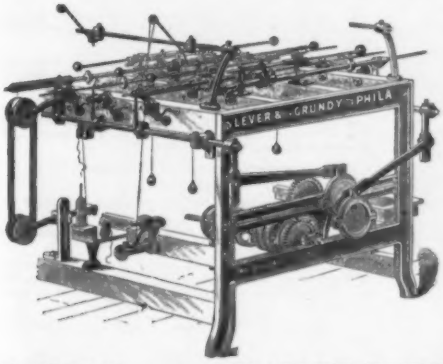
PAID UP LEASES ISSUED.

OSWALD LEVER,

Formerly LEVER & GRUNDY

BUILDERS OF

TEXTILE MACHINERY.



FILLING COP WINDING MACHINES. Spindles driven by belts or by gears. To wind cops. Cops to weave from the inside, or butts to weave from the outside. Can be made to wind any kind of filling from the coarsest to fine numbers. These machines will put the most yarn in as given size of shuttle than any other machine in use.

BANDLESS SPINDLE SPOOLING MACHINES. Adapted to the finer grades of yarn and to the finest silk.

PRESSER DRUM SPOOLING MACHINES. Arranged to spool in any way the trade requires.

BANDLESS VARIABLE SPEED MACHINES. To wind the large bobbins used in knitting mills.

CONICAL and STRAIGHT TUBE WINDING MACHINES.

DRESSER SPOOLING MACHINES.

Beaming Machines, Sectional Warp Mills, Chenille Cutting Machines, Reeling Machines to prevent waste at the bottom of mule bobbins.

Lehigh Ave. & Mascher St., PHILADELPHIA, Pa.

A PERFECT PIN TICKET

For Cloth Samples and Garments.

Easily and quickly applied to fabrics of any weight.
Securely attached and yet easily detached if necessary to remove.
The machine does the whole thing.
It is cheap, serviceable and durable.

We also make a machine which

PRINTS the TICKETS as they are attached if desired.

Send for particulars to

SARANAC ELECTRICAL MFG CO.,

ST. JOSEPH. MICH.

Old Colony

TRADE MARK

GEO·B·CARPENTER & Co.

CHICAGO.

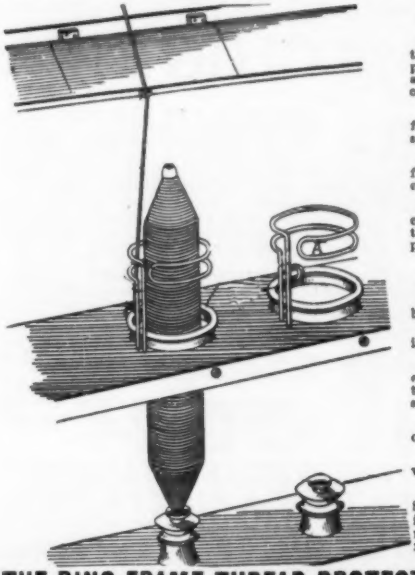
NONE SO GOOD FOR THE PRICE.
NONE BETTER AT ANY PRICE.

ESTD. 1840

ALL SIZES FROM ¼ TO 2" IN DIAMETER IN LENGTHS UP TO 3000 FT. IN STOCK.

TRANSMISSION ROPE

New Thread Protector for Ring Spinning



The following advantages are claimed for this protector.

1. The speed of the frame will be increased, and also the production on frames without any protectors or plain separators about twenty five to thirty per centum, and on frames with separators about twelve or fifteen per centum.

2. The threshing and consequent imperfection and inferiority of yarn and cloth, occasioned by the use of blade separators is entirely obviated.

3. The traverse of the rail can be increased from one-fourth of an inch to one inch, if frame permits, thereby enabling the use of longer bobbins.

4. The life of the traveller is prolonged fully fifty per cent on account of a more even tension being imparted to the traveller, the same being held in a perpendicular position at all points of the traverse,

5. Frame and rail more perfectly balanced.

6. Heavier travelers can be used.

7. The yarn is wound tighter and more uniformly on bobbins.

8. A material saving in time of doffing, as more yarn is wound on, and longer bobbins can be used.

9. Saving of time of the operator on account of fewer ends breaking, thereby increasing the quality of yarn, and the opera or can attend many more spindles in consequence.

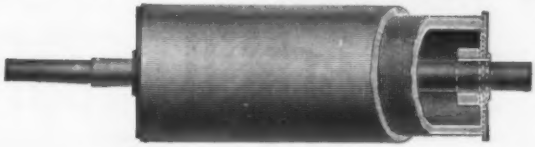
10. The life of the ring will be prolonged on account of decreased friction.

11. No accumulation of lint, dust and dirt, which invariably results in the use of blade separators.

The above results have been obtained in the mills of S Sanford & Sons, Carpet Manufacturers, Amsterdam, N.Y. in whose mills the protectors have been in use on all spinning frames since October 1899, and by permission we refer to said firm for a confirmation of our claims.

THE RING FRAME THREAD PROTECTOR CO., - Amsterdam, N. Y.

Rubber Covered Rollers



That are successfully adapted

FOR ALL PURPOSES IN WOOLEN AND COTTON MILLS.

Our Rubber Coverings are strictly high grade. Thousands of users find them satisfactory and economical.

...CORRESPONDENCE SOLICITED...

When it's anything about rubber ask us.

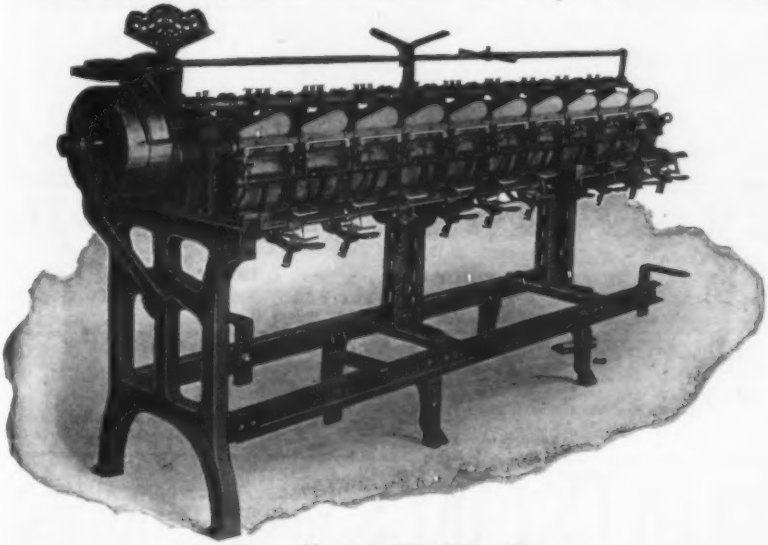
BOSTON BELTING CO.,

James Bennett Forsyth, Mfg. Agt. and Gen. Mgr,

Makers of MECHANICAL RUBBER GOODS.

BOSTON, 256 Devonshire Street. NEW YORK, 100 Reade Street.

Foster Machine Co., WESTFIELD, MASS.



The "1900" Winder

Patented in United States and Europe. Fastest running Winder in the market. Greatest production, best shaped cones. **NO OIL OR DIRT CAN GET ON THE YARN.** Has independent drive for rolls. Even tension and speed. Less power to run. Stop Motion acts when a thread breaks or runs out.

ANYTHING

Entire Outfits for New Mills, or small and odd items that you don't know just where to obtain, can be found at the

AMERICAN SUPPLY CO.
PROVIDENCE, R. I.

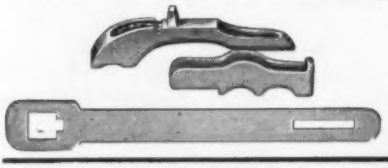
in Mill Supplies.

E. Dixon. Established 1876. F. M. Dixon.

DIXON LUBRICATING SADDLE CO., BRISTOL, R. I.

Sole Manufacturers of

Dixon's Patent Locking Saddles and Stirrups



The weight can be taken off and put on to the middle rolls, without stopping your frames, when long staple cotton is used.

The Stirrup is always in place.

No bent stirrup resting on rolls.

Manufacturers of all kinds of **Saddles, Stirrups and Levers.** Send for Samples and Prices.

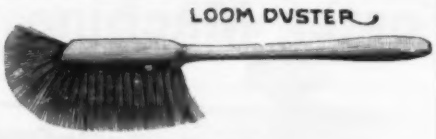
Spinners' Supplies in general.

KILBURN, LINCOLN & CO.,
FALL RIVER, MASS.
MAKERS OF

Looms for Plain and Fancy Weaving.

Represented in the South by SEXTON & ROBBINS CO., CHARLOTTE, N. C.

An Essential to the Weave Room.



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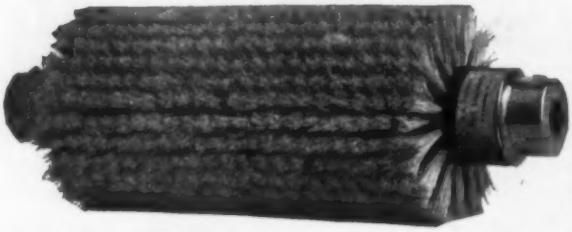

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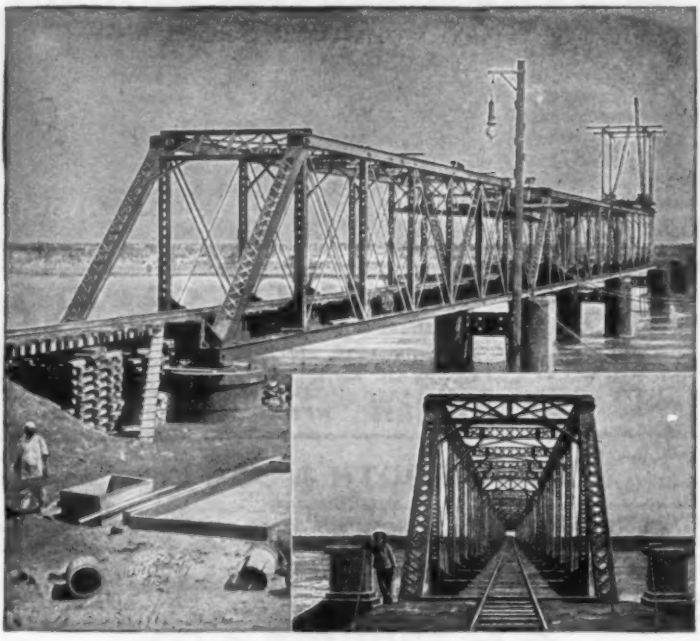

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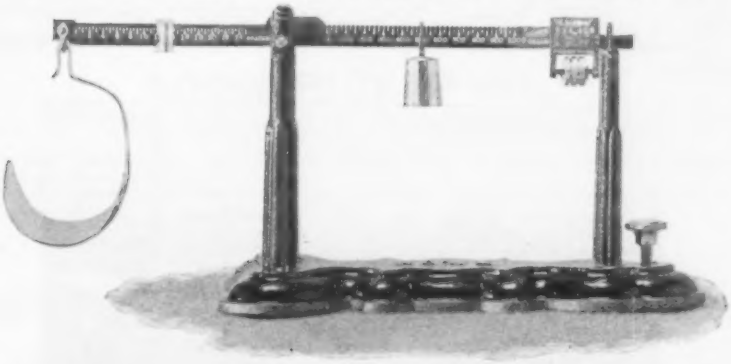

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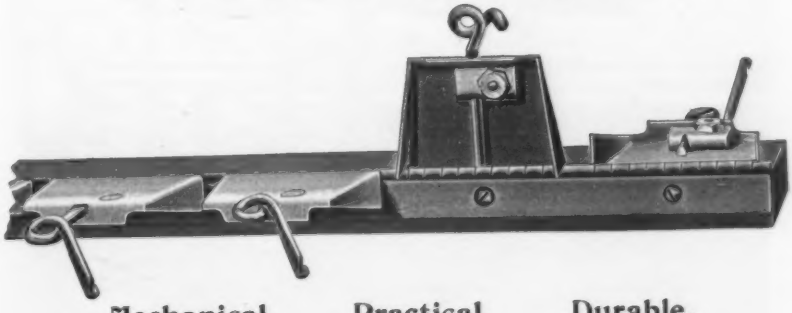

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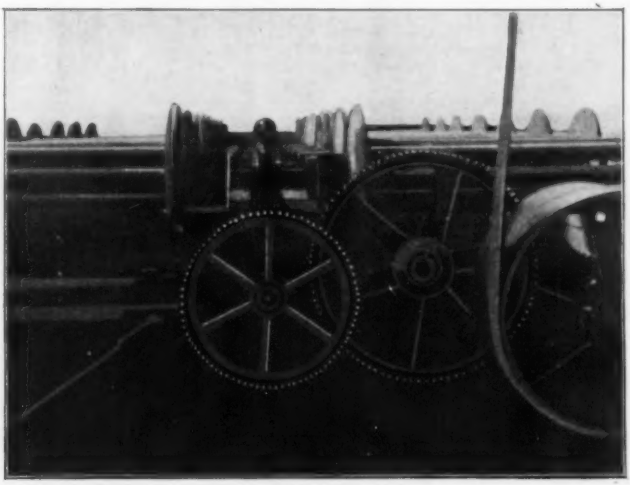

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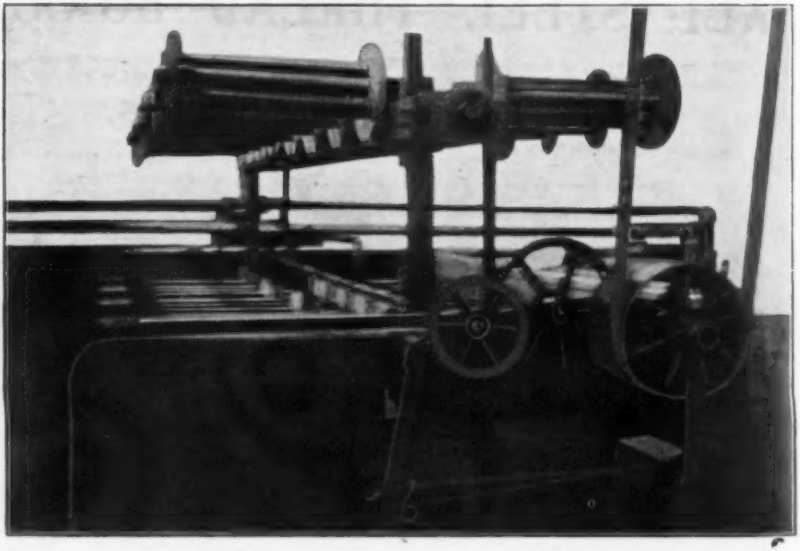

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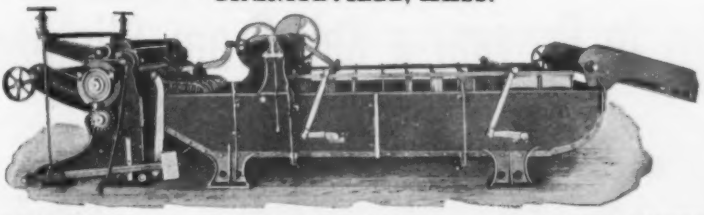

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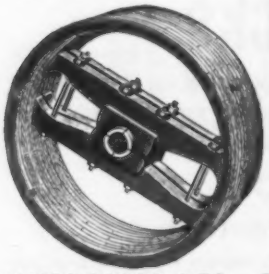

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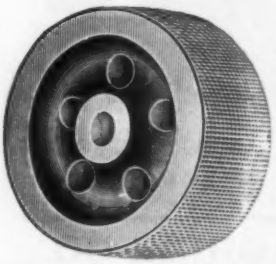

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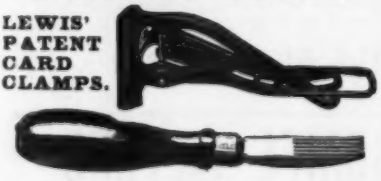

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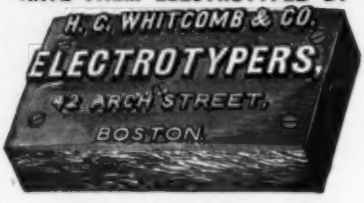

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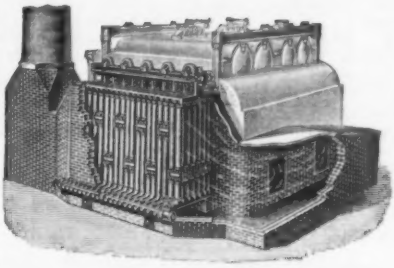

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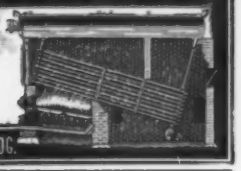

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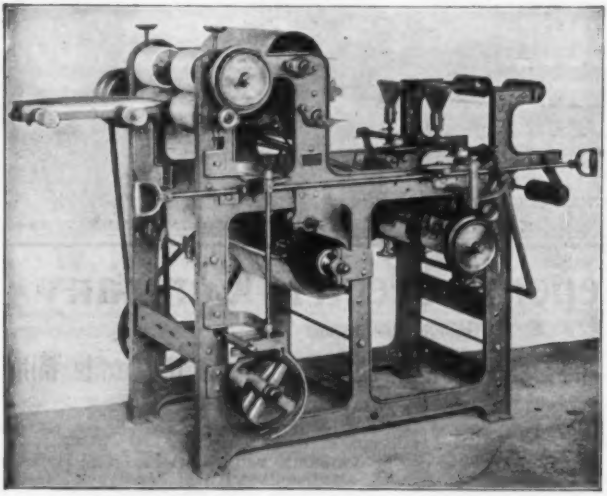

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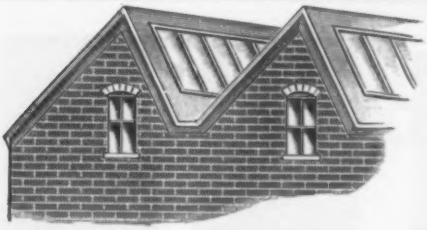

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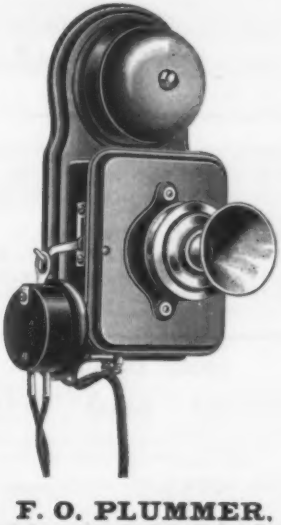

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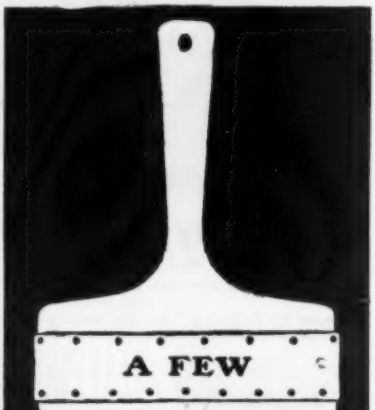

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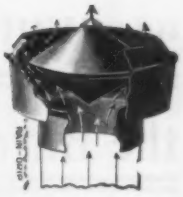

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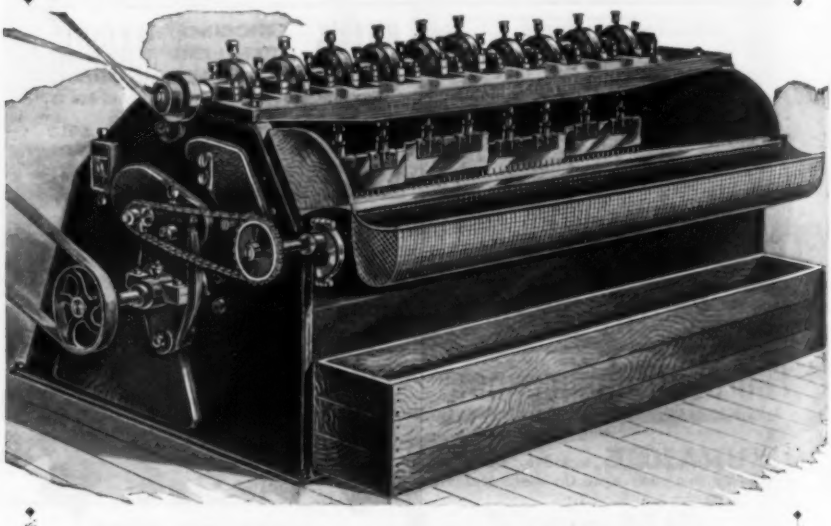

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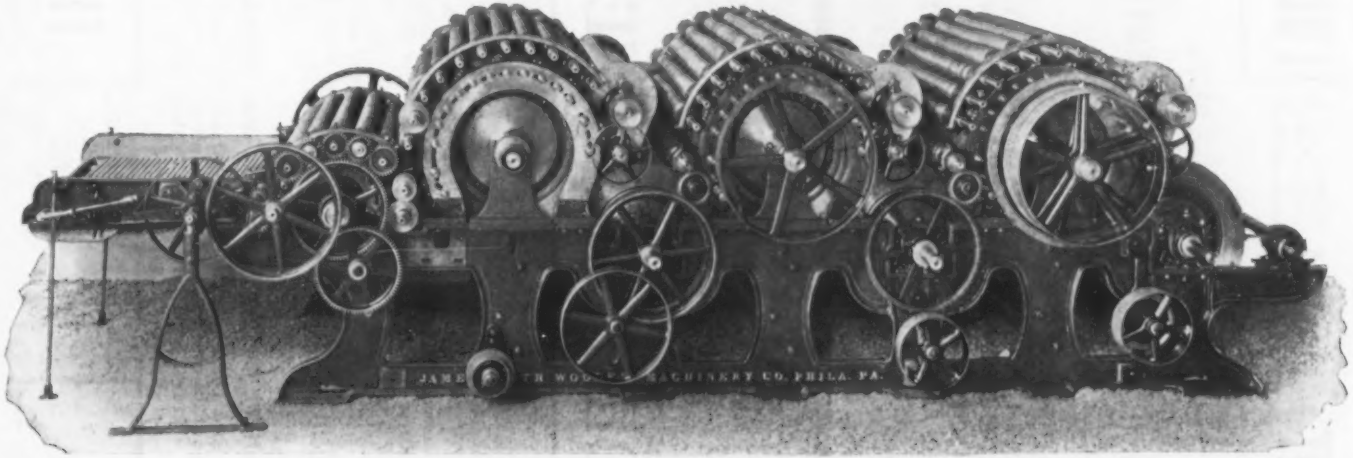

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List of Textile Patents.

Issued April 30th, May 7, 14, 21, 28.

Bleaching Fabrics. 674,759. Charles F. Cross, London, England and George A. Parkes, Muckmore, Ireland.

Carpet Fabric, Ingrain. 673,069. Thos. F. Paylor and Arthur Paylor, Ridderminister, England.

Carpet Fabric, Ingrain. 673,503. William B. Keeper, Philadelphia, Pa.

Cloth Doubling Machine. 674,229 and 674,310. John E. Windle, North Grafton Mass.

Fabric Cutting Machine. 673,405. Henry A. Meyer, Cincinnati, Ohio, assignor to the Wolf Electrical Promoting Company, same place.

Knit Fabric. 675,339. John G. Powell, Philadelphia, Pa., assignor of one-half to Edward Powell, same place.

Knitting Machine Needle. 674,893. Stephen Woodward, Franklin, N. H., assignor to Mayo Knitting Machine & Needle Company, same place.

Knitting Machine Yarn Guides, Automatic Locking Device for. 675,136. Isaac Mossop and Lewis W. Wiefenderfer, Wiconisco, Pa.

Knitting Machine. 673,140 and 673,141. George E. Rutledge, Chicago, Ill., assignor to the George D. Whitcomb Co., same place.

Knitting Machine. 673,163. George Eichenlaub, Philadelphia, Pa., assignor to Thos. Buck & Co., same place.

Knitting Machine. 674,667. George Blood Jr., Philadelphia, Pa.

Knitting Machine Pattern Mechanism. 674,546. Frank Wilcomb, Norristown, Pa.

Loom for Weaving Narrow Fabrics. 675,084. Nicolas Chaize & Jacques Chaize, St. Etienne, France.

Looms; Machine for Twisting in Warp Threads of. 675,350. Albert Goss, Lakeview, N. J.

Loom Let-off and Take-up Mechanism. 673,838. William F. Kintzing, Glenrock, Pa., assignor of one-half to Arthur S. Porrish, same place.

Loom Lug Strap. 673,582. Francis A. Mills, Methuen, Mass., assignor of one-half to Grosvenor B. Emmons, same place.

Loom Shuttle Motion. 673,839. Wm. F. Kintzing, Glenrock, Pa., assignor of one-half to Arthur S. Porrish, same place.

Loom Shuttle, Self-Threading. 673,823. Edward S. Stimpson, Hopedale, Mass., assignor to Draper Co., same place and Portland, Me.

Loom Warp Stop Motion. 673,818. Henry Jones, Belton, S. C., assignor to Draper Co., Portland, Me. and Hopedale, Mass.

Loom Warp Stop Motion. 673,824; 673,825 and 673,826. Edward S. Stimpson, Hopedale, Mass., assignor to Draper Co., same place and Portland, Me.

Loom Let Off Device. 674,149. Frank Wood and William Hinchliffe, Cumberland, R. I.

Loom Pneumatic Shuttle Motion. 674,157. William H. Baker, Central Falls, R. I. and Frederic E. Kip, Montclair, N. J.

Loom Weft Replenishing Mechanism. 674,154; 674,155 and 674,156. Wm. H Baker, Central Falls, R. I., and Frederic E. Kip, Montclair, N. J.

Loom Warp Stop Motion Apparatus. 673,338. Wm. F. Draper, Hopedale, Mass., assignor to Draper Co., same place and Portland, Me.

Loom Shedding Mechanism. 674,413. Eduard Herbertz Munchen, Gladbach, Germany.

Loom Take-Up Mechanism. 674,424. John T. Meats, Taunton, Mass., assignor to Mason Machine Works, same place.

Loom, Weft Replenishing. 674,632. Wm. E. Moore and Frank R. Clark, Augusta, Ga.

Looms, Repairable Gearing for. 674,600. Augustin Chevrette, Fitchburg, Mass.

Mercerizing Machine. 673,067. Frank Shuman, Philadelphia, Pa.

Spinning and Doubling Machinery, Formation of Cops in. 674,723. Thomas Ashworth, Urmston, England.

Willow. 675,248. Charles Schofield, Philadelphia, Pa.

Wool-Washing Machine. 675,069. Frederick G. Sargent, Graniteville, Mass

Woven Fabric. 674,138. Isaac E. Palmer, Middletown, Conn.

Woven Fabric. 673,293. Charles P. Schlegel, Rochester, N. Y., assignor to the Schlegel Mfg. Co., same place.

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This machine is provided with steel toothed cock spur feed roller, driven by compound gearing.

The teeth in the cylinder are made of best steel and are securely fastened in their places.

The grate under the cylinder is made of round bars geared together so that they revolve, preventing the grate from choking.

The gears are covered and the machine provided with adjusting screws to take up the wear.

There is a door at the side for the convenient removal of the dirt and to provide draught.

The Picker discharges from the back underneath.

The 40-inch Picker is driven by two belts from a countershaft which accompanies the machine.

We also make a light pattern 18-inch Picker for small mills.

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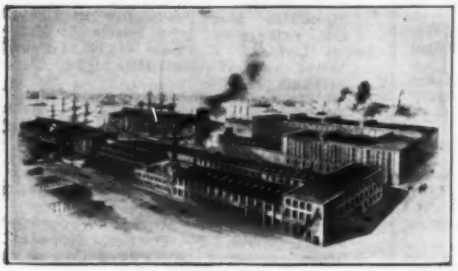

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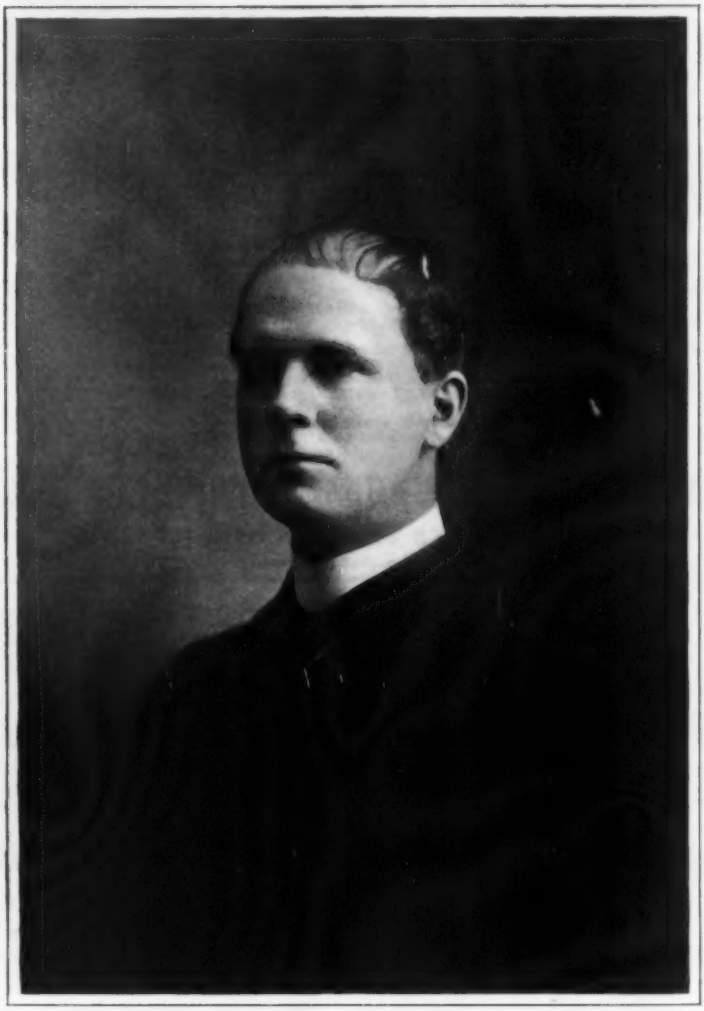


CHARLES H. FISH.

President of the New England Cotton Manufacturers' Association.

TEXTILE WORLD.

Vol. XX. JUNE, 1901. No. 5.

CHARLES H. FISH.

Mr. Charles H. Fish, the newly elected president of the N. E. Cotton Manufacturers' Association, was born in Taunton, Mass., being the third son of Captain Frederick L. Fish, and Mary Jarvis Perry; Captain Fish being one of the best know and most successful of the old New Bedford whaling captains.

Having a natural love for mechanics, he immediately, upon the completion of his education, entered the machine shops of the Amoskeag Manufacturing Company in Manchester, N. H., serving an apprenticeship in the shops, and working on through the various departments of the mills, until finally appointed to the position of Assistant Superintendent.

He next accepted the position of Agent of the Chicopee Manufacturing Company at Chicopee Falls, Mass, which he held until he received the appointment of General Manager of large private manufacturing interests in New Hampshire. While in this position, and during the next few years, he was employed as Consulting and Constructing Engineer by many large corporations in different parts of the Country and by the United States Government.

In 1895 Mr. Fish accepted the agency of the Cocheco Manufacturing Company's Mills and Print Works, Dover, N. H., which position he now holds. He is a member of the American Society of Mechanical Engineers, and various other scientific and social organizations.

STOCK GOODS.

The accumulation of stock goods in the cotton trade is well known. In fact this branch of the industry enjoys the advantage of a system by which the trade is kept fairly well posted at all times as to the extent of such accumulations. This is due to the staple character of a large bulk of the product, and also to the concentration of selling operations, as in the case of print cloths in Fall River. We call this publicity an advantage, because stock goods exert sooner or later precisely the same effect on the market whether their presence be known or not. The advantage in the facts being known consists in bringing remedial measures into action to reduce the stocks and avert the danger.

In other lines of textiles, such as woolen, silk and knit goods, the trade is kept in more or less ignorance of the yardage on hand and unsold. The production comes from many widely scattered mills. Each mill manager knows what the stock of his own concern is, but has a very faint idea of the stock throughout the country. He carries as large a stock as his capital and credit warrant, and in a dull time does not hesitate to strain this capacity to the limit in order to keep up the production and lower the cost. The result of this policy is an unseen accumulation of goods in the market. The buyer in his travels from house to house discovers the presence of these various piles of goods and is able to form a quick and accurate estimate of the condition as a whole.

An article is worth only what it will bring in the market. Its cost bears but an indirect relation to its value to the owner. For this reason the prevention of any accumulation of stock goods is one of the first requirements for a return of healthy conditions in textile manufacturing. Only when the balance between supply and demand has been restored can the manufacturer hope to secure the full advantage that follows a reduction of cost to its lowest terms.

In all branches of textile manufacturing the same monotonous depression prevails throughout the world. The idle silk looms of Paterson are duplicated in Lyons. The unsatisfactory condition of woolen manufacturing in this country finds its counterpart in all of the European woolen districts. The cotton manufacturers of this country, who are face to face with a large accumulation of unsold merchandise, and who are seeking to remedy the trouble by cutting the prices of goods, shutting down mills and reducing wages, will find their fellow manufacturers of England and Continental Europe in exactly the same predicament as themselves. The knit business is also suffering from similar conditions irrespective of national boundaries.

This world-wide depression in the textile business proves, if it proves anything, that the energy at present expended in making textiles is far in excess of the demand.

The woolen and worsted heavyweight business this season has been far from sufficient to keep the looms in this country busy, and there are suggestions made that things would be different if we had free wool. Undoubtedly they would. Under the last free wool regime things were so different that no one wants them repeated, except the few who thrive on the misfortune of others.

In the cotton business this clamor for free raw material cannot be made because cotton is free. The remedy most frequently suggested is the enlargement of our foreign trade. This, however, takes much time and is not available at once. Curtailment seems to be the only remedy in sight, and is being adopted, although not to the extent which conditions require, if we can judge by the Fall River print cloth market; here we find the stock of goods larger at the end of the shut down than at the beginning.

The evil of overproduction is due in a great measure to the practice of piling up goods for stock. A prominent commission merchant stated to us recently, that one of the most difficult things he was called upon to do was to prevent less manufacturers from making stock goods. In reply to the agent's remonstrances the manufacturer would reply that a few hundred pieces amounted to nothing and would surely sell sometime, as they were staple goods. The result of this policy was that a large stock of goods remained on hand to increase the interest account, and finally to be closed out at a loss.

A few hundred pieces of stock goods appear small to the individual, but a like quantity in the hands of each manufacturer means a stock that is a menace to the market. The combinations of textile mills, which are progressing so rapidly, may do a great deal to remedy this evil of overproduction. To the man financing a mill with 100 looms, $50,000 worth of goods may appear small, but to the financial manager of a mill with 6000 looms $3,000,000 worth of unsold merchandise is a serious matter, and is avoided at all hazards. And yet in these cases the stocks are proportionately equal. The ratio per loom in either case applied to all of the mills of the country would give the same stock and mean the same danger to the business.

—Society is charming if we interest each other.—Jules Michelet.

—One can sometimes reach the rough man, never the cold man.—De Sivry.

ADJUSTMENT OF LABOR TROUBLES.

More cotton goods are today manufactured in England than in any other country. England has over 42 per cent. of the cotton spindles in the world, and was the first country in which the development of the industry by improved machinery and methods into the modern factory system took place. She thus furnishes the best field in which to study this development.

In accordance with the recognized principle that modern industrial development means organization and combination of both employer and employee, we find in the oldest and largest cotton manufacturing country that organization has been carried farther on both sides than in any other country.

Up to within a few years this organization has been maintained with a strong belief on each side that it was necessary in order to protect each from the oppression of the other; and it must be admitted that this idea was not entirely without reason.

In recent years there have appeared signs of another view being accepted concerning the mutual relations which should exist between the two parties. It has of course been long accepted as a theoretical proposition that the real interests of labor and capital were one; but this idea did not advance beyond the realm of theory; it did not come very close to the mill gates.

The great strike of the English cotton operatives in 1892, resulted in a settlement (called the Brooklands Agreement), which showed plainly that the acceptance of this principle of a common interest between labor and capital, was making progress on both sides. It has been recognized that the one weak point in this settlement was the lack of some automatic method of advancing and reducing wages, based on the condition of trade, or in other words, on the cost of cotton and selling price of manufactured goods.

To secure an agreement for such sliding scale, proposals, which were accepted, were made to the operatives some months ago by the mill owners that conferences be held on the subject of a sliding scale. Such systems of regulating wages have been quite extensively adopted in other English trades and have resulted in preventing many strikes and lockouts. While the recent negotiations between the mill owners and operatives have not resulted in any agreement, the various views advanced on both sides, show not only the concessions which each side is willing to make to secure a sliding scale, but they also bring out the great difficulty in reaching an agreement, and the mutual suspicion which exists on each side for fear the other will secure some unfair advantage.

Both employer and employee agreed that it was desirable to settle their differences in some other way than by expensive strikes and lockouts, which result in a great loss to both sides and injury to British trade; the difficulty came in applying the recognized principles to actual conditions.

The manufacturers first made the following proposition:

> It is agreed that the percentage of profit in 1898 shall be ascertained as nearly as possible, and be made the standard rate of profit on capital, in the future adjustment of wages.

The method of arriving at the profit was as follows: Twelve mills spinning standard counts of yarn, four of them spinning 34s to 40s, four spinning 40s to 54s, and four spinning 60s and upward, were to be selected, and accountants were to determine the profits of these mills for the year 1898. These accountants were to be furnished with quotations for raw cotton and for cotton yarn furnished by certain yarn agents or brokers agreed upon by both parties; and then the profits of the mills in question were to be calculated as if daily purchases of cotton and sales of yarn had been made throughout the year at the quotations furnished. This method of calculating the cost of cotton and the price of yarn was adopted in order to elimi-

nate all effects of speculation. A certain percentage was to be allowed for depreciation of the plant.

The next clause in the manufacturers' proposition was as follows:

> No increase of wages shall be made, unless the profit on capital during the twelve preceding months shall be more than two per cent. per annum above the standard rate of profit, nor shall any reduction of wages be made unless the profit during the same period be more than two per cent. below the standard rate. Any advance of wages was to be at the rate of two and one-half per cent. for every two per cent. rise in profit; the reduction was to be in the same proportion. There was to be a limit of ten per cent. either way, beyond which an advance or reduction should not go. The accountants were to accept the book valuation of the twelve mills in question, in making up their accounts.

The proposition of the manufacturers contained many provisions in regard to details, such as the grades of cotton to be selected and the notice to be given by either party requesting any change in the schedule; but, the above gives the main points in the manufacturers' proposals.

In the discussion which followed, it was proposed on the part of the employers that five per cent. would be a fair rate of profit to accept as a standard. This proposition was made in response to the objections on the part of the operatives to taking the 1898 rate of profit as a standard, and that they (the operatives) would prefer a net margin of profit to be agreed upon in advance of further discussion.

The question then arose as to what amount per pound on 34s and 40s would give the employers a five per cent. margin of profit. During the discussion on this point, the question of valuation of the plant was brought up, and the operatives proposed that ½ ct. per pound be accepted as the net margin required to give the mill owners a profit of five per cent. on the invested capital. They also proposed that the mills should be valued at $1.95 per spindle, and that 85 cts. per spindle should be allowed for working capital. To this proposition, the employers replied that a valuation of $3.65 per spindle, with $1.22 for working capital, would be about right. One of the representatives of the employers handed in the following statement, to show how much per pound was required to enable five per cent. to be earned on the capital:

Mill of 100,000 spindles, spinning 34s twist and 40s weft:

Fixed capital $3.65 per sp.....	$365,000
Working capital $1.22 per sp.....	122,000
Total capital.....	$487,000
Five per cent. profit on above...	24,350

A production of eleven ozs. per spindle per day would amount to 3,300,000 lbs. for forty-eight weeks. The five per cent. profit on this production would equal $\frac{1}{13}$ cents per pound.

The employers insisted that it was impossible to accept ½ ct. per pound as sufficient to yield 5 per cent. on the capital, and that the amount per pound could only be determined by calculation. To the request on the part of the employers that such examination should be made, by the result of which both parties were to be bound, the operatives declined to modify their views, adhering firmly to the ½ ct. per pound. The negotiations came to an end at this point.

We do not propose to discuss here the details of the various propositions put forth by either side. We simply wish to call the attention of our readers to the progress which is being made in England towards finding a better way of settling wage disputes than by strikes, lockouts and the maintenance of a state of continual hostility between employer and employee.

—A firm of dyers and finishers at Roubaix, France, has recently invented a process of printing designs on plain woolen fabrics which, it is claimed, are permanent and will withstand dyeing, pressing, stretching, and the other operations of finishing. The effects produced remain unchanged when the fabric is made into a garment. L'Industrie Textile calls the process a "remarkable innovation." The goods are treated before dyeing, and it is said that no method heretofore employed has given such permanent effects.

—One of our richest possessions is the secret testimony which we give to ourselves.—Voltaire.

Speed and Production of Cotton Combers.

Editor Textile World:

The articles in the January issue on Cotton Combers, are good, and cannot fail to aid overseers in our mills.

It is a mistake to assume that any fixed rules can be laid down in regard to the production and speed of cotton combers. Speed and production depend largely upon the stock used and the method of preparing the stock for the combing machine. There is a great deal of wisdom in the saying that a man in order to be successful in life should select his ancestors with great care, and the same principle applies to the success of the combing process. The preparatory processes should be selected with great care.

Overseers of combing are apt to neglect the many little things outside of their room that affect the production and quality of their work, and when production falls off and complaints are made as to the quality of their work, they wonder what the causes are.

The pounding, beating motion of the cotton comber makes it necessary to adopt a different method of adjustment than is employed in a machine like the card, where the motions are continuous and steady.

If I were taking a position in the carding and combing department in a mill, and found that the quality and production were neither what they should be, I would first go over the room carefully and locate all of the causes of the poor work; then I would take each one separately and correct it. After having brought the combing and carding machinery to the best possible condition, I would go back into the picker room, and commence there to put things in shape; to get a good uniform lap that would not split, would be the first object of my endeavor; in other words, I would try to make the pickers do the work they were designed to do, and not put this work on the cards.

I have been through carding rooms where work was being carded for combers, in which it seemed as if the overseer had an idea that the only thing necessary was to keep the machines running. This is a great mistake. The overseer should keep his carding as near perfect as if there was no combing done at the mill. When the work comes from the cards in as good shape as it is possible to have it, the comber has a chance to do good work and get out a large production, besides reducing the amount of waste to a minimum. He can then put the speed of the combers up, and still do good work.

Many are of the opinion that 80 beats per minute mark the limit beyond which the speed of the comber should not go, but I have run combers at 95 with good results, simply because the material was well prepared before it reached the comber. I would prefer to run a fairly light lap, and keep the machine at a correspondingly higher speed, rather than to run the comber slow on a heavy lap; but, as I said at the beginning of this article, no set rule can be laid down for the speed and production of a comber, as there are so many varying conditions.

If a position was offered to me in which I was notified that I must run the machine at such a speed and turn out such a production with such a percentage of waste, I should be inclined to resign before I accepted the position. The most successful combers that I know of today, are those that do not follow any set rule, but adapt themselves to circumstances. The theories are all right, but practical experience rules, I think, after all.

I have seen men who knew more about the comber than the man who built the machine, could figure on the draft and speed, and yet were flat failures when judged by the production and quality of work. Then again I have seen many a man who was weak when it came to theory and rules, but who could adjust a comber to different kinds of work and different conditions, so that judged by the produc-

tion and the quality he was a success in every sense of the word.

I do not wish to be understood as belittling the value of theory and rules. They are essential as guides to the practical man, but alone they are not sufficient. They must be accompanied by judgment acquired only by experience and which a good overseer has at his command, for use in any emergency.

A man can see what gives him the best results, but when he lays down a rule for others to go by, he puts me in mind of the man who knows it all; he has undoubtedly reached a point where he will learn very little more.

SKILL.

Editor Textile World:

I have been much interested in the views of overseers, on the subject of cotton combers, which appeared in your January issue.

In setting the top comb, the fluted segment should be adjusted so the needles can be gauged on the top comb from 18 to 22. The nipper should be set so as to be down as the half lap passes underneath. Great care should be used in setting the cushion plates, so that the nipper will hold the cotton as the needles of the half lap pass through, and send the noil to the doffer.

If the stock is Sea Island cotton, I should say that 260 revolutions per minute for the Heilman comber would be about right, while on Egyptian cotton the machine might run 320 revolutions per minute. A good production on Sea Island would be 175 pounds per week, and on Egyptian about 260 pounds per week. A larger percentage of noil generally comes from Sea Island than from other grades of cotton. The percentage of noil depends altogether on the adjustment of the machine. There are 17 strips of needles on the cylinder. The first row is No. 10, and the next five rows No. 22 wire, and then the wire grows gradually finer until the 16th and 17th rows have about a No. 35 wire.

The needles are liable to get broken, if care is not taken to prevent the nipper from going down too low. No. 22 wire should have 32 needles to the inch; 24 wire, 40 per inch; 26 wire, 50 per inch; 28 wire, 60 per inch; 30 wire, 75 per inch; and 33 wire, 85 per inch. This is for fine work, and the top comb should not have any coarser than 28 wire.

In setting these top combs, they should be adjusted so as to be down in their places at the same time. The best way to set them, is to take a piece of paper, place it under the set screw, and adjust by the screw in such a way that the paper will be released at all points at the same time. Set the quadrant to have the comb down in proper time. In setting the nippers, be sure you have the cushion plate on, and adjust them by the back screw. In order to have them raise at the same time, they can be adjusted by the nipper rod.

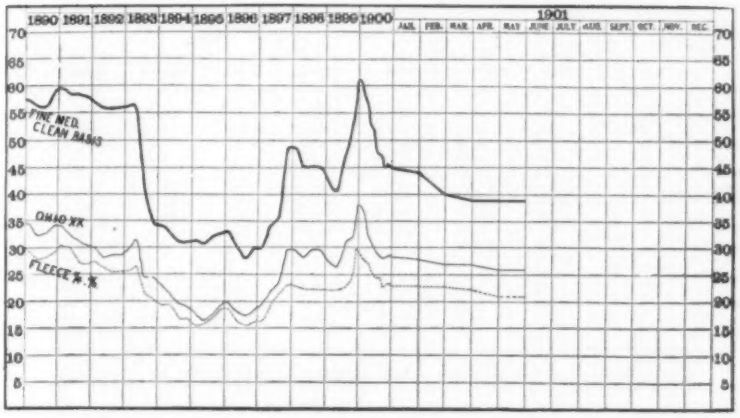
ELI.

—The bad effects of wearing pearl-gray silk hosiery, colored by repeated baths in a solution of zinc chloride, has been demonstrated by Dr. Adolph Jolles before the Vienna Medical Society. Dr. Jolles writes the U. S. Consul at Coburg, showing conclusively that as much as 25 per cent. of the zinc coloring matter was still on the hosiery when it was packed for market, and that the danger from absorbing this poison through the pores of the skin was very great.

—A new material for covering the rolls of cotton spinning frames has appeared in France. It consists of a mixture of one part of nitrocellulose, and two parts of nitroricinoline. This material is moulded in the form of tubes ready to put on the rolls, or is made into ribbons which are wound on the rolls and then spliced. The manufacturers claim that it is superior to any other material used.

—The subordinate who shares the confidences of the master guards the secrets closer than the master can himself.—d'Houdetot.

WOOL MARKET.



There has been no change in wool market since our last report. Transactions have been very small at the seaboard cities. It is reported that buyers have been operating with less freedom in the West.

The goods market has continued very unsatisfactory. Purchasers of goods are placing orders very slowly, and manufacturers have confined their purchase of wool to actual requirements. The existing conditions are the result of an elimination of the speculative element. This contingent seems to have been satiated by the experience of 1899 and 1900, and are now standing one side and allowing supply and demand to have a monopoly of regulating prices. This action on the part of speculators is heartily to be commended. It is to be hoped that in the interest of the wool grower as well as the manufacturer they will maintain this attitude indefinitely. The wool trade has been a great sufferer from speculation. It is probably too much to expect there will not be a recurrence of this evil, but at the present time it is certainly absent from the market.

This dull season has been taken advantage of to discuss new methods of marketing the staple, and various alluring schemes have been proposed by which the manufacturer and wool grower are to deal with each other direct. It seems by no means improbable that some change will gradually take place in the present primitive methods of marketing wool, but it is not to be effected in a day or a year. The concentration of manufacturing in a few large concerns simplifies the problem somewhat. In all branches of trade and industry the tendency is strong toward the elimination of all useless charges, and in view of the chances to effect economies in selling wool, it would not be surprising to see the effort made to concentrate the selling of this product.

—A modification of the fine system in textile mills is reported as having been adopted by a Pennsylvania firm. The employees are to be fined for mistakes, and the fines so collected are to be set aside and distributed at stated periods among the employees who have not been fined.

—Those who render a service should forget it; those who receive one should remember it.—Mlle. Aisse.

—There are men so clever as to find the secret of appearing modest while satisfying their vanity.—Coeuilhe.

EXPORTS AND IMPORTS OF RAW WOOL, YARN AND WASTE.

Lbs. in units of one million. Value in units of $100,000.

Year Ending June 30.	Exports.		Imports.					
	Wool.		Wool.		Shoddy, noils, etc.		Yarn.	
	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.
1890	.231	.335	106.8	152.6	5.0	20.5	3.5	19.9
1891	.291	.394	129.3	182.4	1.2	4.3	2.0	11.9
1892	.202	.306	148.7	196.9	.3	.9	1.3	7.5
1893	.091	.148	172.4	210.6	.3	1.1	1.2	6.9
1894	.520	.906	55.2	61.1	.1	.5	.5	3.6
1895	4.259	4.844	192.8	229.9	14.1	19.8	2.4	11.7
1896	6.945	8.559	228.4	315.0	18.7	26.5	2.0	10.5
1897	5.271	6.199	386.6	567.5	49.9	69.3	1.8	9.6
1898	.121	.180	132.8	167.8	3.3	6.9	.3	1.9
1899	1.653	2.373	76.7	83.2	.3	.7	.2	1.1
1900	2.200	3.872	155.9	202.6	.4	.9	.2	1.3
6 mos.	.107	.115	44.0	54.9	.388	1.089	.105	.702
Jan.	.018	.018	9.2	10.6	.048	.16	.028	.15
Feb.	.042	.089	7.5	8.3	.037	.11	.011	.08
March	.004	.004	10.3	14.6	.039	.13	.013	.08
April	.002	.003	8.9	11	.043	.14	.039	.24

EXPORTS AND IMPORTS OF MANUFACTURED WOOLENS.

Value in units of $100,000.

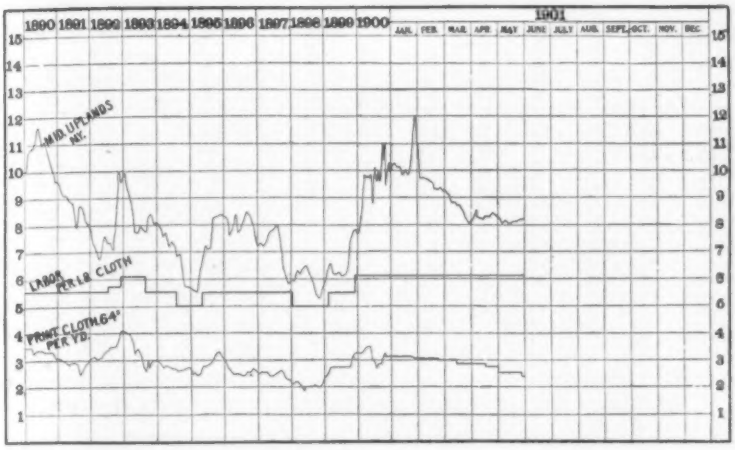
Year Ending June 30.	Exports — Value.						Imports — Value.							
	Carpets.	Dress Goods.	Flannels and Blankets.	Apparel.	Other.	Total	Carpets.	Cloths.	Dress Goods.	Shawls.	Clothing	Knit Goods.	Other.	Total.
1890	.067	..	.409	3.179	.719	4.374	7.5	161.4	242.0	10.1	18.4	19.8	66.2	525.4
1891	.184	..	.265	4.240	.502	5.191	13.7	120.3	182.4	7.2	18.6	12.5	39.7	394.4
1892	.093	..	.244	2.689	.649	3.675	12.9	127.6	164.7	3.5	14.8	11.6	12.1	347.2
1893	.115	..	.242	2.224	.679	3.260	15.8	151.2	164.8	2.8	11.7	14.1	12.0	372.4
1894	2.500	..	.387	3.172	1.685	7.744	9.6	67.6	85.8	1.6	8.6	10.0	7.2	190.4
1895	1.610	..	.498	3.161	1.432	6.701	13.6	163.0	144.0	2.0	10.0	9.4	11.8	353.8
1896	2.252	..	.370	3.653	2.860	9.135	8.9	218.9	199.3	4.5	13.0	25.4	27.4	497.4
1897	1.895	..	.573	3.858	3.150	9.476	7.8	170.1	167.9	4.6	9.8	25.3	27.0	412.5
1898	1.612	.414	.474	4.290	4.074	10.89	17.9	89.6	60.4	.4	7.6	3.9	9.6	189.4
1899	.811	.169	.427	5.388	3.679	10.47	17.6	39.1	59.1	.5	8.3	6.3	5.6	136.5
1900	1.150	.244	1.002	5.654	4.485	12.54	27.5	51.3	58.7	.8	9.9	5.0	6.3	159.5
6 mos.	.471	.040	.581	3.909	3.107	8.17	13.57	21.71	24.95	.51	7.29	2.69	2.61	73.33
Jan.	.110	.044	.165	.578	.255	1.15	1.98	5.57	8.31	.02	.34	.12	.59	16.83
Feb.	.125	.012	.037	.80	.199	1.17	1.87	3.99	6.33	.04	.62	.19	.57	15.61
March	.098	.008	.080	.66	.46	13.06	2.06	2.52	4.98	.04	1.07	.38	.34	11.39
April	.066	.001	.015	.78	.30	11.62	2.78	1.61	2.81	.06	.52	.21	.32	8.26

—Experiments have been made in France in scouring wool by ozone, and are said to have given very satisfactory results. The wool is placed on screens in an air tight receptacle and the ozone is forced through the wool by pumps. The grease is converted into a liquid, and readily carried off, leaving the wool in good condition and the fibre soft and elastic. It is said that one pound of ozone is required for scouring 2000 lbs. of wool. The process leaves the fibre white so that but a small quantity of sulphurous acid is required to bleach the fibre a clear white after it has been scoured by this method. One patent has been granted on this process in France, and others are pending.

—Reports from Belgium state, that the cotton industry is in bad shape. Weavers are working from three to four days per week. When employed full time a Belgium weaver running two looms earns $2.90 per week; for four looms the weekly wage is $3.50 per week; the working time is eleven hours per day.

—According to U. S. Consul at Liverpool, a firm in that city are arranging to send six American cotton-growing experts to the west coast of Africa, to institute experiments in the growing of cotton in that region by the most improved methods.

COTTON MARKET.


1890 1891 1892 1893 1894 1895 1896 1897 1898 1899 1900
1901
JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.
MID UPLANDS NY.
LABOR PER LB CLOTH
PRINT CLOTH 64" PER YD.

The fluctuations in quotations for the raw material have been within narrow limits during the month of May, as our chart plainly shows. The decline during the early and middle part of the month was followed by a recovery, which left prices at the beginning of June practically where they were a month previous. Unfortunately this is not the case with the manufactured product. The market for yarn and manufactured goods has become still more unsatisfactory.

In spite of the curtailment of production in both yarn and cloth, the market still remains in the buyers' favor. At Fall River stocks of goods have steadily increased, and the cut made in the price of print cloths to 2 9/16 at the beginning of the month, and followed up later by another cut to 2 6/16, has not resulted in any reduction of the quantity on hand. Manufacturers of cotton goods are finding a rather hard road to travel. Conditions in the goods market abroad is in an equally unsatisfactory state. French cotton manufacturers have agreed to run but five days per week beginning June 15, 1901.

Advices from the cotton fields indicate that the new crop is backward. The Government report of condition, May 31, states that the average condition of the growing crop is 81.5 per cent. as compared with 82.5 per cent. on June 1 last year, 85.7 at the corresponding date in 1889 and 86.4 per cent. the mean of June averages of the last ten years. A condition of 81.5 per cent. is with one exception the lowest June condition in 20 years. The condition by states is as follows: North Carolina, 87 per cent.; South Carolina, 80 per cent.; Georgia, 80 per cent.; Florida, 88 per cent.; Alabama, 76 per cent.; Mississippi, 82 per cent.; Louisiana, 80 per cent.; Texas, 84 per cent.; Arkansas, 81 per cent.; Tennessee, 78 per cent.; Oklahoma, 88 per cent., and the Indian Territory, 85 per cent.

The Department of Agriculture estimates the total area planted in cotton at 27,532,000 acres, an increase of 2,111,000 acres, or 8.3 per cent. over the acreage planted last year, and of 2,498,000 acres, or 10 per cent. over the acreage actually picked.

The Chronicle estimates the world's visible supply May 31st, at 3,239,162 bales, as compared with 2,369,422 bales at same time in 1900; 4,368,616 bales in 1899 and 3,596,480 bales in 1898.

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	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.
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1900	2.200	3.872	155.9	202.6	.4	.9	.2	1.3
6 mos.	.107	.115	44.0	54.9	.318	1.080	.105	.702
Jan.	.018	.018	9.2	10.6	.048	.16	.028	.15
Feb.	.042	.039	7.5	8.3	.037	.11	.011	.08
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1891	.184	..	.265	4.240	.502	5.191	13.7	120.3	182.4	7.2	18.6	12.5	39.7	394.4
1892	.093	..	.244	2.689	.649	3.675	12.9	127.6	164.7	3.5	14.8	11.6	12.1	347.2
1893	.115	..	.242	2.224	.679	3.260	15.8	151.2	164.8	2.8	11.7	14.1	12.0	372.4
1894	2.500	..	.387	3.172	1.685	7.744	9.6	67.6	85.8	1.6	8.6	10.0	7.2	190.4
1895	1.610	..	.498	3.161	1.432	6.701	13.6	163.0	144.9	2.0	10.0	9.4	11.8	353.8
1896	2.252	..	.370	5.653	2.860	9.135	8.9	218.9	199.3	4.5	13.0	25.4	27.4	497.4
1897	1.895	..	.573	3.858	3.150	9.476	7.8	170.1	167.9	4.6	9.8	25.3	27.0	412.5
1898	1.642	.414	.474	4.290	4.074	10.89	17.9	89.6	60.4	.4	7.6	3.9	9.6	189.4
1899	.811	.169	.427	5.388	3.679	10.47	17.6	39.1	39.1	.5	8.3	6.3	5.6	136.5
1900	1.150	.244	1.002	5.654	4.485	12.54	27.5	51.3	58.7	.8	9.9	5.0	6.3	159.5
6 mos.	.471	.040	.583	3.969	3.107	8.17	13.57	21.71	24.95	.51	7.29	2.69	2.61	73.33
Jan.	.110	.044	.165	.578	.255	1.15	1.98	5.57	8.31	.02	.34	.12	.59	16.83
Feb.	.145	.012	.037	.80	.199	1.17	1.87	3.99	6.33	.04	.62	.19	.57	13.61
March	.098	.008	.089	.66	.46	13.06	2.16	2.52	4.98	.04	1.07	.88	.34	11.39
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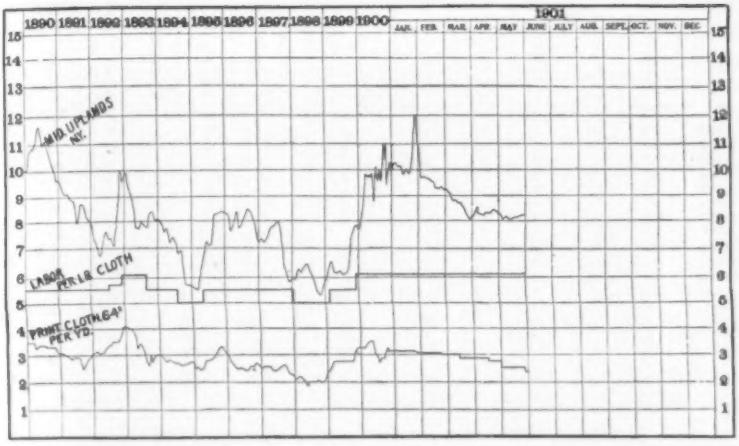
—According to U. S. Consul at Liverpool, a firm in that city are arranging to send six American cotton-growing experts to the west coast of Africa, to institute experiments in the growing of cotton in that region by the most improved methods.

COTTON MARKET.


1890 1891 1892 1893 1894 1895 1896 1897 1898 1899 1900
1901
JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.
MID. UPLANDS N.Y.
LARGE PER LB CLOTH
PRINT CLOTH 64" PER YD.

The fluctuations in quotations for the raw material have been within narrow limits during the month of May, as our chart plainly shows. The decline during the early and middle part of the month was followed by a recovery, which left prices at the beginning of June practically where they were a month previous. Unfortunately this is not the case with the manufactured product. The market for yarn and manufactured goods has become still more unsatisfactory.

In spite of the curtailment of production in both yarn and cloth, the market still remains in the buyers' favor. At Fall River stocks of goods have steadily increased, and the cut made in the price of print cloths to 2 9/16 at the beginning of the month, and followed up later by another cut to 2 6/16, has not resulted in any reduction of the quantity on hand. Manufacturers of cotton goods are finding a rather hard road to travel. Conditions in the goods market abroad is in an equally unsatisfactory state. French cotton manufacturers have agreed to run but five days per week beginning June 15, 1901.

Advices from the cotton fields indicate that the new crop is backward. The Government report of condition, May 31, states that the average condition of the growing crop is 81.5 per cent. as compared with 82.5 per cent. on June 1 last year, 85.7 at the corresponding date in 1889 and 86.4 per cent. the mean of June averages of the last ten years. A condition of 81.5 per cent. is with one exception the lowest June condition in 20 years. The condition by states is as follows: North Carolina, 87 per cent.; South Carolina, 80 per cent.; Georgia, 80 per cent.; Florida, 88 per cent.; Alabama, 76 per cent.; Mississippi, 82 per cent.; Louisiana, 80 per cent.; Texas, 84 per cent.; Arkansas, 81 per cent.; Tennessee, 78 per cent.; Oklahoma, 88 per cent., and the Indian Territory, 85 per cent.

The Department of Agriculture estimates the total area planted in cotton at 27,532,000 acres, an increase of 2,111,000 acres, or 8.3 per cent. over the acreage planted last year, and of 2,498,000 acres, or 10 per cent. over the acreage actually picked.

The Chronicle estimates the world's visible supply May 31st, at 3,239,162 bales, as compared with 2,369,422 bales at same time in 1900; 4,368,616 bales in 1899 and 3,596,480 bales in 1898.

EXPORTS AND IMPORTS OF MANUFACTURED COTTONS.

Value in units of $100,000.

Year Ending June 30.	Exports — Value.					Imports — Value.							
	Colored.	Uncolored.	Apparel.	Other.	Total.	Colored.	Uncolored.	Apparel	Laces, etc.	Thread.	Knit Goods.	Other.	Total.
1890	29	55	2	14	100	33.7	1.3	3.4	114.5	9	71.5	65.8	299.2
1891	26	93	3	15	137	42.4	1.7	12	105.9	8.6	67.4	59.2	297.2
1892	25	87	4	16	132	45	1.4	12.6	112.5	6.6	58.8	46.7	283.1
1893	28	63	5	22	118	55.4	2.6	16.8	127.4	7.6	63.9	61.8	335.5
1894	38	76	5	24	143	33.8	1	16.6	80.2	3.3	43.6	45	223.5
1895	35	70	5	28	138	54.3	1.2	27.7	116.9	6.6	65.4	59.9	332
1896	34	95	7	32	168	49.2	1.8	26.8	108.8	8.7	61.9	67.1	324.3
1897	48	125	9	29	211	44	2.7	26.3	125.7	6.5	56	83	344.2
1898	41	92	9	25	167	53.1	1.2	10.5	117.7	6.9	40.3	42.9	272.6
1899	52	138	13	30	233	66.5	1.1	10.3	145.5	8.5	43.4	45.3	320.6
1900	48	132	16	37	233	81.6	3.6	12.4	102.1	21	47.2	55.3	413.2
6 mos.	27.18	28.46	7.97	15.71	79.32	25.66	.99	7.16	99.98	9.64	22.54	28.76	194.73
Jan.	4.96	5.41	1.11	2.57	13.04	12.48	.22	1.25	22.16	1.30	4.99	3.72	46.12
Feb.	4.96	4.96	1.16	2.38	13.46	7.49	.81	1.66	19.76	1.34	6.91	4.11	41.58
March	4.92	7.08	1.40	2.82	16.23	4.77	.16	1.85	18.59	1.38	6.59	3.72	37.06
April	8.76	5.80	1.65	2.70	18.91	3.48	.12	1.25	17.40	1.23	5.67	3.33	37.48

EXPORTS AND IMPORTS OF RAW COTTON AND WASTE.

Lbs. in units of one million. Value in units of $100,000.

Year Ending June 30.	Exports.									Imports.				
	Sea Island.		Other.		Total.			Cotton Waste.		Raw Cotton.			Cotton Waste.	
	Lbs.	Value	Lbs.	Value.	Lbs.	Value.	Value per lb.	Lbs.	Value.	Lbs.	Value.	Value per lb	Lbs.	Value
1890	9	23	2462	2486	2471	2509	10.15	..	..	8.6	13.9	16.16	..	..
1891	14	31	2893	2876	2907	2907	10.00	..	..	20.9	28.2	13.49	..	..
1892	19	16	2926	2568	2945	2584	8.77	..	..	28.7	32.1	11.18	..	..
1893	8	17	2204	1870	2212	1887	8.53	..	..	43.4	46.9	10.80	1.9	.8
1894	14	29	2669	2080	2683	2109	7.82	..	..	27.7	30	10.83	2.7	.9
1895	15	28	3502	2021	3517	2049	5.82	..	..	49.3	47	9.53	2.9	1
1896	19	38	2316	1862	2335	1900	8.13	..	..	55.3	66	11.93	6	2.1
1897	21	41	3082	2268	3103	2309	7.12	..	.	51.9	59	11.36	5.3	1.7
1898	16	28	3884	2277	3850	2304	5.98	19.1	7.9	52.7	50	9.48	6.7	1.5
1899	14	24	3759	2072	3773	2096	5.55	21.1	8.3	50.2	50.1	9.98	6	2.1
1900	18	30	3082	2388	3100	2418	7.80	38.6	17.7	67.4	79.6	11.81	7.9	2.4
6 mos.	3.4	7.5	1833.3	1785.6	1836.7	1793.1	9.76	27.05	14.41	20.84	29.96	14.37	3.19	.97
Jan.	1.83	3.7	367.6	354.8	369.4	358.5	9.75	4.94	2.52	5.59	8.66	15.5	.48	.15
Feb.	1.13	2.2	233.3	221.2	234.3	223.4	9.55	5.20	2.67	4.39	6.82	15.5	.14	.04
March	.95	1.80	299.8	266.4	300.8	268.2	8.91	4.15	2.09	3.89	6.20	15.9	.69	.18
April	2.13	3.84	257.4	218.8	259.6	221.9	8.54	2.93	1.67	4.34	6.51	15.0	.30	.12

—About a year ago we called attention to the manner in which Indian cotton yarns were invading the French-Indo-China. To meet this competition, French capitalists have since erected cotton mills in this French colony. L'Industrie Textile states that one of the mills recently erected has over 16,000 spindles in operation, turning out a product of about 3960 lbs. of No. 20's cotton yarn per day. This mill has been planned, constructed, and put in operation within a period of eighteen months. The operatives consist of 200 men (coolies), and 400 women, from the teeming population of the neighboring village of Haiphong near the mill. Another mill is now being projected, which will make three in this province.

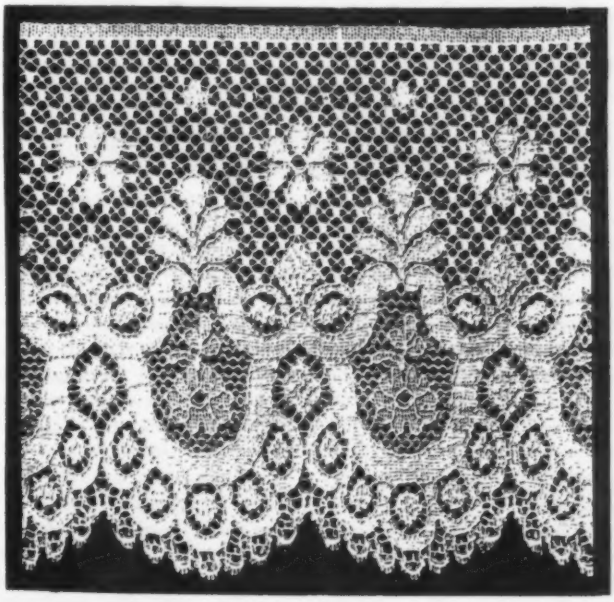
—A stock of picric acid in a chemical works at Griesheim was struck by lightning on April 25th. The resulting explosion set fire to the buildings. One hour and a half later a steam boiler in the works exploded, followed two hours later by a second, and then soon after a third boiler explosion. Seventeen people were killed and many injured.

The Machine Made Lace Industry.

The invention of the stocking knitting frame by William Lee in 1586, marked the beginning of a revolution in the lace industry which had previous to that time been confined entirely to hand work. It was not until about one hundred and seventy-two years later, however, that lace was produced by machines.

The growth of this manufacture of lace by machine in France forms the subject of an elaborate work by M. Henri Henon, a prominent lace manufacturer of Calais, France, and it is by his permission that we make extracts from his work for this article. The proceeds from the sale of the book are to be contributed towards the erection of a monument in one of the public places of Calais to the great inventor

WORKROOM IN A LACE FACTORY.



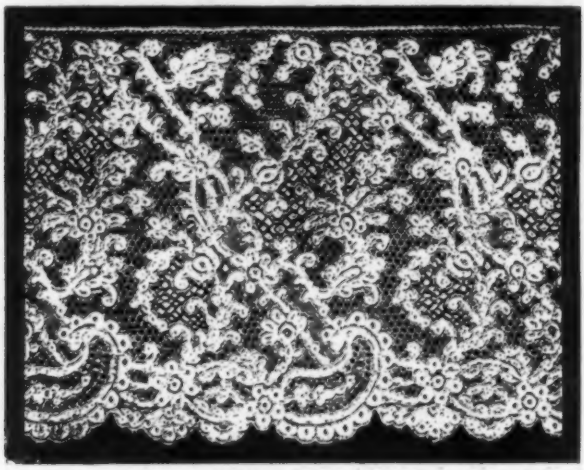
GUIPURE SOIL (Henri Henon, 1885).

Jacquard, whose invention made it possible to reproduce in lace by machinery the beautiful designs that could previously be obtained only by hand.

Before the invention of the lace machine, lace was the badge of wealth and aristocracy, but the reduction in cost effected by the machine placed this luxury within the reach of the multitude.

The early development of the industry occurred in England, and various devices were brought out for the purpose of making a clean cut mesh or loop similar to that of the hand made goods. The difficulty at this time was that the threads were not bound or twisted tightly together, and the loops were so soft and unstable that a sizing had to be applied to hold them in place. In 1786 the "double press" system was invented by which the loop was made much more solid. The mechanism was still very crude, and a high degree of skill was required to produce a fair quality of lace by machinery.

The invention of the warp machine was the next step, which was soon followed by the device of Crane by which a loop similar to that of Valencienne lace, was produced. Up to the end of the eighteenth century, the machine lace industry made but little progress in France. The government of England, where the industry had already become firmly established, endeavored in every way possible to prevent its introduction into other countries. The French were persistent, however, and by means of their own inventions and the more or less secret study of the machines and processes in England, the French lace industry was kept alive.



DENTELLE BINCHE (Henri Henon, 1889).

The French government gave substantial encouragement to its development, even throughout the tumultuous revolutionary period. The sentiment of universal equality which had taken hold of the minds of the masses, found in machine made lace a means of expression. Formerly it had been the aristocrat alone who could afford the expensive hand made lace; but, coincident with the supposed leveling of social inequalities by the French Revolution, the lace machine gave to the poor citizen the ornament which previously had been the exclusive possession of the aristocrat.

The appearance of the "bobbin machine," invented by Heathcote in 1809, was soon followed by a complete transformation in the industry, due to this and other inventions which soon followed it. The loop was made on the

bobbin machine by means of bobbins passed back and forth in small carriers, the warp was held in a vertical position, the general idea having been obtained from the shuttle loom. Each carrier was moved by a "pusher" which was operated independently, so that it could be moved or left idle, according to requirements of the design.

Many improvements in the method of vibrating the bobbins soon followed, and the English lace industry enjoyed great prosperity. At this time, 1809, machine made lace sold for over $20 per square yard. The superiority of the lace made on the bobbin machine over the Mechlin lace made on the old warp machine, rendered the old machines worthless.

In 1802 Napoleon prohibited the importation of lace into France, and this greatly stimulated the home industry. In England laws had been passed, inflicting severe penalties for the exportation of lace machinery to foreign countries, but in spite of this prohibition, English machines were secretly brought into France, and English lace makers followed, as they are now coming to America, to build up the lace industry in a foreign land. As a result of the growth of the French lace manufacture, the population of Saint-Pierre-les-Calais, during a few years preceding 1817, had increased tenfold.

In 1814 the Leaver machine was constructed, in which the mechanism for actuating the carriers was greatly improved, and it was on this machine that nearly all the figured lace was made before the invention of Jacquard. The other machines were limited to the production of the ground work, on which the fancy designs were worked by hand, and even the ground work on the old machines required binding threads to be inserted by hand.

In 1837 the Jacquard system was applied to the warp lace machine. Previous to this the figured designs on lace were made on the Leavers machine with its limited capacity for fancy effects, or embroidered slowly and expensively by hand. It is to the inven-

DENTELLE COTON (Capelle Freres, 1894).

tion of Jacquard that the world owes the development of the machine made lace industry. It enabled the designer to give full play to his talent by removing the mechanical restrictions in the working out of his designs.

Our illustrations are taken from M. Henon's work, and represent some of the designs produced by the French lace manufacturers in recent years.

The various methods of manufacturing lace vary but little in different places, whether at Calais, Lyons, or in Nottingham, England.

NEUVILLE BORD DROIT (Ch. Daron, 1898)

The Leavers machine reinforced by a more or less complete Jacquard attachment is the one now generally used. The equipment of the lace factory comprises a certain number of Leavers machines with their accessories, and all other apparatus necessary to the preparation of the yarn for the machine, such as that for reeling, warping, and winding the yarn, and cutting and lacing the cards for the Jacquard machine. A modern Leavers machine ready for operations costs from $3000 to $5000, and sometimes as high as $6000, according to the size, setting, and fineness of the gauge.

The manufacture of lace requires a series of operations which may be divided into two parts. The first consists in the selection of the fabric and the preparation of the design which is to be employed. This design is then given to a specialist who is called "metteur en carte," who traces the design upon paper as closely as the power of his lace machine will permit. He must work the threads so as to imitate, as nearly as possible, the real hand lace, and at the same time he must give the workmen at the machine the necessary instruction for mounting the work in the machine. After the design is traced on the paper, a chart is constructed showing the various movements and combinations of the threads, which serves as a guide for cutting the cards for the jacquard machine.

The second division of the work comprises the reeling of the yarn which has been selected, winding it on spools for the warp, and for the filling, on the bobbins which serve as shuttles. The warp is then placed on the machine, the jacquard machine is adjusted, and a small portion of the lace is made in order to show what corrections are necessary; after this the machine is turned over to the workmen for the production of the merchandise. Frequently, designs which have been prepared with great care are found to require long and difficult corrections before the machine can be started, and sometimes it is necessary to prepare the work anew.

This correction of the work, after it is put into the machine, forms an important item in the cost of the goods. After coming from the lace machine it is given to the sewers or menders for the correction of faults.

It is then bleached, colored, finished, trimmed, examined, and mounted on cards, sampled and sent to market to await a purchaser, who, attracted by the goods, may desire to favor the manufacturer with an order.

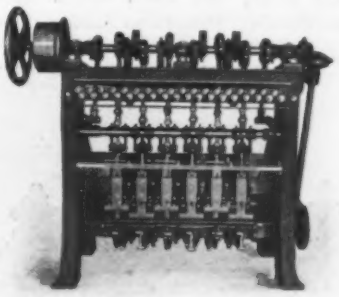
An important item in the expense of a lace manufactory consists in the goods which it is necessary to give away for samples. M. Henon states that investigations on this point show that on certain standard articles the cost for samples amounts to from 3 to 5 per cent. of the total value of the production; while for novelty laces this item amounts to about 9 per cent., or an average cost for samples of 6½ per cent.

A Multiple Needle Sewing Machine.

Our illustration shows a multiple needle sewing machine manufactured by L. F. Fales, Walpole, Mass. These machines are adapted for goods that require to be stitched in parallel lines such as blankets, carpet linings and similar goods. The history of the development of this machine in response to the demands of the trade make an interesting story. About twenty years ago Mr. Fales invented a machine for sewing carpet linings. It gave such good satisfaction on this work, that he decided to extend its use. The first twenty-five machines, each having five or six needles were used for carpet lining work; then a few with from eleven to twenty-four needles were built for the horse blanket trade. These machines also gave good satisfaction; they were sold to nearly all the leading manufacturers, some of them having as many as three machines.

Up to this time the needles were not placed nearer than three inches apart. In response to many enquiries for a machine that would sew closer together one was designed with seventy-two needles, ¼-inch apart. This was quite an undertaking, and there was a great deal of uncertainty as to the result, but it worked very well and gave excellent satisfaction. It was used for sewing muslin; later a machine with seventy-two needles was built for sewing curled hair and is still in successful operation.

The long experience which Mr. Fales has had in making this line of sewing



machines enables him to simplify the mechanism, and adapt it to the various requirements of the trade. The machines are all built on the same general lines, and the working parts are made as light as possible consistent with strength. The handle bar swings with the material, and is given the whole movement by being directly connected with an eccentric. This eccentric gives the up and down movement, also the oscillation of the handle while traveling with the material.

The material is drawn in by feed rolls placed as close to the handles as possible, and along the whole length of the machine. These rolls are varied to suit the class of material to be sewed. Some of the machines handle goods 100 inches wide and as the fabric must be held firmly in order to get the proper tension, very strong drive is a necessity. In addition to the multiple sewing machine, Mr. Fales makes a specialty of designing attachments for measuring and conveying material after it has been sewed.

—Man is but a reed, the weakest that nature produces; yet it is a reed that thinks.—Pascal.

Cotton Wash Dress Goods.

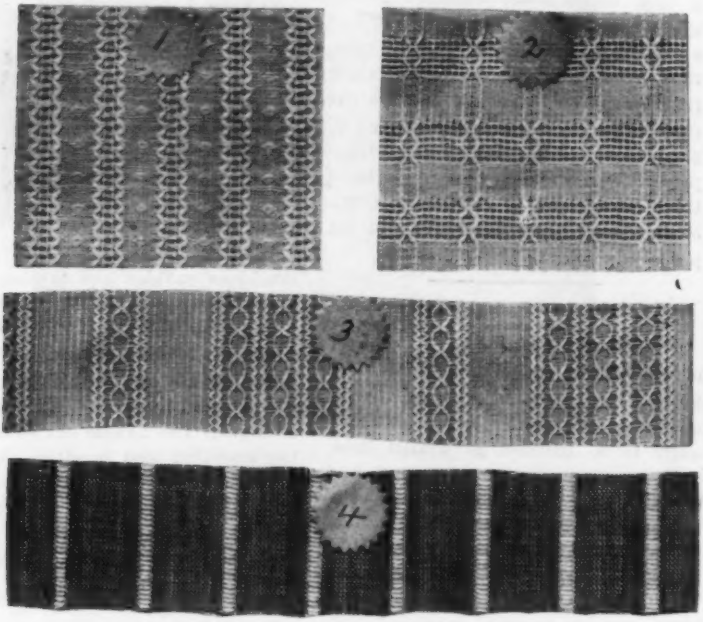
Notwithstanding the cold and backward season, business on cotton wash dress goods has been unusually satisfactory and the near approach of the end of the season finds stocks very low, with a fair volume of duplicate orders still coming in.

White goods of every description have been in high popularity and many pretty and novel effects have been shown. Prominent among these are the open work effects, figure 1, representing a fabric of this description made in four styles, and sold by Elms & Co., New York, at 12½ cents net. This is a 30-inch cloth, known to the trade as a "Leno Brilliant Stripe."

Figure 2 represents a fabric of the same description in a checked open work effect, 30 inches in width, sold to the trade at 13 cents net.

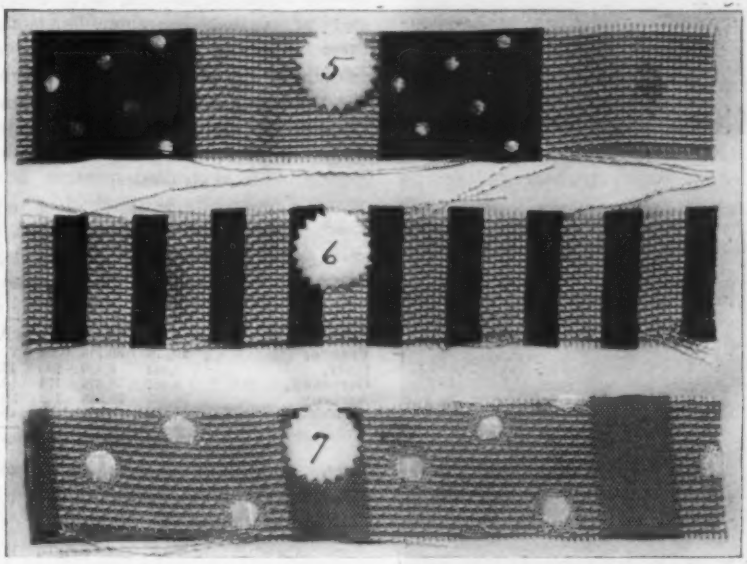
Figure 3 represents a very handsome Leno Stripe effect with a woven dimity cord, which has been a good seller at 13½ cents net in a 30-inch width. This pattern is also made in a large line of colors in delicate shades of blue, pink, lavender, ecru, cardinal, etc.; the prime favorite among these being the deep ecru or natural linen color, which has been held in such high favor throughout the season. All of the above fabrics are from the line of Elm & Co.

The demand for all classes of corded Chambrays during the season of 1900 has been far exceeded by the demand of 1901, and this popular fabric still maintains its place in the public favor. In figure 4 is illustrated a mercerized Chambray, woven cord effect, which possesses the combined attributes of stylishness and serviceability. This cloth is shown in a choice selection of ground colorings, all with a woven white stripe, making a very neat and effective design. This fabric is 27 inches in width and is sold by J. P. Stevens & Co., New York, at 17½ cents net. The same cloth in the plain weave without the cord effect has also been a good seller at 16½ cents net.



Silk Fabrics.

Among the many beautiful productions of this season none perhaps have attained the popularity of the Grenadine effects, which are being shown in such a vast variety of beautiful designs and which serve to increase the high reputation of our home manufacturers. As the season advances and styles are approved or disapproved, black and white effects have continued to grow in the public favor.



In Fig. 5 we illustrate a very handsome combination in a ground work of white Grenadine, fortified by black satin stripes with white woven polka dots. This cloth in a 21-inch width has sold very freely at 70 cents regular. In Fig. 6 is illustrated another black and white combination of white Grenadine and black satin stripes. Still another exquisite creation, which displays very delicate workmanship, is illustrated in Fig. 7. The ground work is white Grenadine with woven satin polka dots in white, and satin stripes in many delicate shades. All of the above are 21 inches in width and are sold to the trade at 70 cents regular by the house of A. D. Julliard & Co.

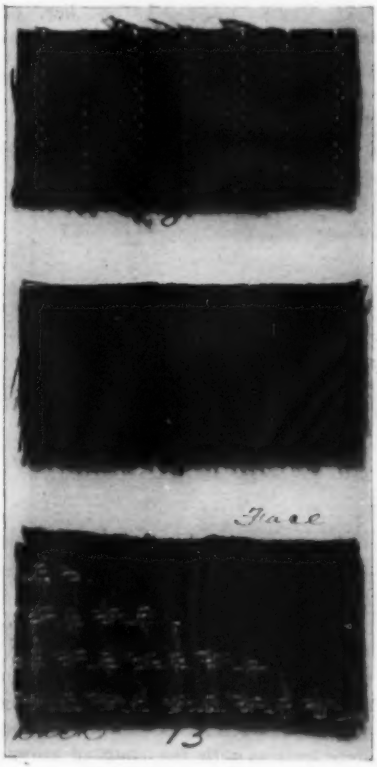
Men's Wear Woolens.

The market on men's wear of woolen and worsted fabrics has been far from active during the past month. Original orders from the manufacturing trade were light and re-orders have not been coming in very freely. The weather has, of course, been a factor in the case, and the fact that spring business has been light with the retailer naturally makes him cautious about placing large orders with the clothing manufacturer for fall.

The bulk of the business done has been on staple goods, and buyers are not placing large orders on fancy lines. Prices on the whole are irregular, but in some cases have been well maintained.

For fall wear, small, neat effects in black and white combinations are considered good and are attracting considerable attention from buyers. Fig. 8 illustrates one pattern in hard-

finished, all-worsted fabric, which have been very good sellers with I. Schlesinger & Co., at $1.75 regular, 6/4 width. Brown effects are also considered very good for fall and are being shown in fancy cheviot effects for fall overcoatings in 6/4 goods, sold to the trade by Schlesinger & Co. at $2.75 regular; they bid fair to replace the Covert and Oxford cloths with the finer trade. A fabric which has



been a good seller is sold by the American Woolen Co. at $2.60 regular.

No. 11 has also been a good selling trousering pattern from The American Woolen Co.'s line, at $2.25.

The Hockanum Co., Rockville, Conn., are showing a large and varied assortment of unfinished worsted and hard finished worsted in quiet and subdued designs. One of the best selling lines is sold at $2.62½, 6/4 width.

Wool Skirtings.

There is no indication whatever that would point to the return of the plaid back, and it is apparently a thing of the past. A plain back cloth with neat woven pattern on the face has been a good seller for fall and is increasing in popularity with the skirt manufacturing trade.

Fig. 13 illustrates a very successful cloth, which H. B. Clark & Co. have sold at $1.15 regular in 6/4 width.

—The matters submitted to juries of the Paris Exposition, were many and of varied character. Among them was the question as to the growth of the silk industry throughout the world since 1889. The conclusions of the jury are embodied in the following tables:

POWER LOOMS.

Country.	Looms in 1889.	Looms in 1900.	Per ct. increase.	Per ct. of average increase.
Switzerland,	6,441	11,465	78	10.1
France,	20,072	30,710	52	21.4
Italy,	2,534	8,489	235	12.0
Germany,	4,587	12,614	174	16.1
America,	14,811	29,945	102	30.4
Austria,	4,000	9,000	125	10.0
	52,445	102,223	...	100.0

The number of hand looms in 1899 is stated at 103,199, as compared with 145,997 or a decrease of 29 3/10 per cent. Calculating that the productive capacity of one power loom is equal to that of three and one-half hand looms, the total productive capacity in 1900 would be equal to that of 131,708 power looms, as compared with 94,158 in 1889, or an increase of about 40 per cent. This increase is divided among the different countries as follows:

Switzerland	13.1%
France	36.3%
Italy	8.8%
Germany	11.4%
America	22.8%
Austria	7.6%

—The days of one's life are very much alike, especially for the unfortunate.—Soulary.

Mill Help.

BY A WOMAN WHO HAS BEEN A WEAVER FOR THIRTY-FOUR YEARS AND IS STILL AT IT.

I have read with great interest the article by Old Supt. regarding the help, as an important factor in the success of a mill. I have worked nearly all my life in the mill. I began when eight years of age, and am now forty-two; not in a knitting mill, but in a weave room all these years.

Now I would like to ask, in a very kind, mild manner, what are the rewards given those who work for their employer with all the energy and interest that they can command? I have always been very anxious to turn out all the production possible, and as near perfect as human skill can make it; have studied every possible way to give satisfaction; have had many restless nights when anything has gone wrong with my work, and can say with a clear conscience that I have done what I could all these years, and am at a loss to find out in what respect I am better off than are the careless, indifferent operatives described by your correspondent.

Punctuality has been my rule; always ready to start up at the given signal; have worked overtime, scores of hours altogether, in the morning and at noon time, taking off cuts, oiling and cleaning, in order that the looms might be kept running as much as possible, both for my own benefit, and also that of my employers.

The only satisfaction I have in return for all of these years of toil is that I have often earned above the average wages; on one occasion the overseer was called into the office and asked if it were possible for one weaver to earn so much, and the overseer said it was possible, and that I had always honestly earned my money; this is the only time I ever received the least encouragement from overseer, second-hand, or anyone else, although I worked in one mill twelve years and in another 11 years, almost without a break.

Having lived within the walls of the mill all this time, I have closely observed the inside workings, and it is to that I wish to call particular attention. I have arrived at the following conclusions, which if carried out, would surely produce the kind of help that Old Supt. wishes to see and have. I am of the opinion that mill work is as good as any other, and if the operatives are always anxious to get out of the mill and reluctant to return, then there is something wrong about it, and let us try and find out what that something is.

I will class my impressions under three heads which I believe include the reasons for help acting as described. Impression First:—In many cases men that are quite unworthy and unqualified are placed in charge over those who object to these men on account of the principles they possess. To show more clearly what I mean: I once asked an overseer for an hour off before time one evening, and if I dare write or you print the reason he assigned for my request, your readers would surely say with me, that such a depraved man was unfit to fill a position worth twenty-five or thirty dollars per week; under such a man those that are weak in principle cannot improve, and the good will skip out as soon as possible, because they hate the man placed over them.

Impression Second—Favoritism is the greatest evil that prevails in our mills at the present day; I have seen it all along; no matter where you go, this evil can be found, and it does not take long for even a stranger to detect it; as a rule the favorites are very prominent when the bosses are around. One case in point; I as well as other weavers once had some very bad running work, consisting of black warps on 20 harness. Although working hard, I could make but very low wages, and continued hoping that

something better would follow. I exerted every effort to run the warp out. There was a favorite who had the same kind of work, and when I had run one of my warps out the boss actually had the bad warp taken out of her loom and put into my loom, giving her something on which she could make good wages.

I felt that this was almost too much to bear, and after making many efforts, I at last found myself facing the overseer in his office. I tremblingly related what had taken place and he swung himself round in his chair and told me if I did not like it, I knew what to do; I never forgot those stinging words; had he been a proper man, he would have helped me out of my difficulty, but I was no favorite; favoritism drove me out of that mill, and I have never returned and will never again take another pick for that individual.

Favoritism is not only confined to overseers and second-hands; even superintendents and managers in some rare cases have their favorites. One case of this class, for illustration. I once knew an overseer whom all the operatives, with one exception, respected and willingly worked for; this one would stay out when she chose, and on more than one occasion the overseer could not find her at her work, and remonstrated with her because of this, stating that he required all employees to first obtain his permission to absent themselves from work; she ignored him and all he said but told him she would see the superintendent at noon time, and did so; four o'clock the same day, that overseer was paid up and never saw the favorite or superintendent since. Favoritism also drove that man out of that mill, where he was doing all he could for the benefit of employee and employer.

Impression Third—The accommodations afforded in our mills are far from what they ought to be; here all nationalities are mixed together like pigs in a market. I have worked in mills where there are only two closets (one for each sex) to accommodate 500 employees altogether; this is the sorest point I find in my mill life. If overseers need clean closets I maintain the help are equally deserving and ought to have them by all means, as the working men and women are just as much entitled to such privileges as the bosses. I do not attempt to draw a race line, but I do say that, if there were better accommodations afforded, the risks of contamination would be greatly lessened. Let every closet be kept thoroughly clean and well ventilated; this can be done at little cost.

Now these are my impressions of what are the chief objections in mill life, and to the capitalist and mill owners I would like to just say a few words. I respect these gentlemen, we cannot get along without them, and I do not blame them altogether for the conditions, as I do not believe they know half of what the mill operatives endure; they pay men to carry on their work; they provide the money; this no one can deny, but I want them to have more consideration for us.

The desire to earn an honest living has brought thousands of us within the mill walls. We simply ask that earning this honest living shall not be made unnecessarily difficult and disagreeable. We shall then not want to run away from the work at every chance. Mill work is hard enough to follow at the best; therefore, Mr. Mill Owner, make it as pleasant and comfortable as you can for those who honestly endeavor to earn their daily bread; remember there are many mothers working in the mills who are not only working there, but at the same time nursing their offspring; life is doubly hard for those mothers. I have often noticed them taking their young in the cold winter mornings to some neighbors to nurse during the day, while the mother goes into the mill to earn something for herself and to help to raise that little boy or girl to become a mill worker in turn.

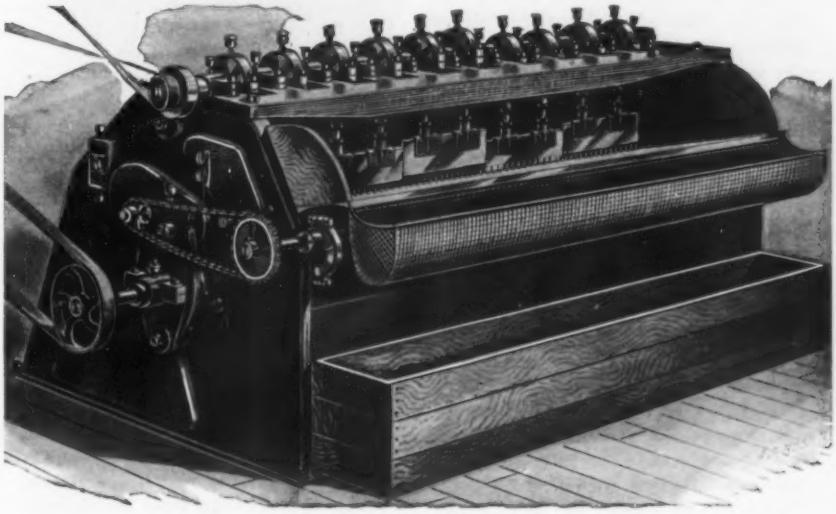
Pray be very careful in the selection of all your officers, from the fixers up to the superintendent; there are good men who are also competent, while there are men who are neither. Provide good accommodations; nothing inferior to what you would consider suitable for yourself. Treat everyone according to their merits, and if there are those that will not be what they should, there is a way to dispose of all such in quick time. Then there would be an end of these kaleidoscopic changes in help which we now see daily in our mills; new faces among the workers; new faces among the bosses; workpeople trying to weave goods of which they have never seen the like before; all because they have been dissatisfied at their last place, and some of them have woeful tales to tell of how they have been treated at their last place of work.

In conclusion I believe that if mills were run on the plans I have mentioned, we should have no need of these ever-shifting scenes around our mill gates and offices. I am fully persuaded that the causes of all this may be remedied if only proper men exercised authority.

THE OTHER SIDE.

A New Wool Burring Machine.

The accompanying illustration shows a new machine for burring wool, which has recently been perfected by the Cheesman Co., 27 William St., New York, and put to a practical test with satisfactory results, which warrant the builders in claiming that it will remove hard burrs from wool either in the grease or scoured state, and without injury to the staple, no matter how long it is. The importance of such a machine to woolen manufacturers can hardly be over-stated.



THE CHEESMAN WOOL BURRING MACHINE.

One of the most serious difficulties in the preparation of wool for manufacturing is the removal of burrs. These burrs and other vegetable matter can of course be removed by carbonizing. This process, however, affects the fibre more or less injuriously. Under the most favorable circumstances, carbonized wool is harsher and more difficult to card and spin than wool that has not been carbonized. It is also impossible to get as good a finish on goods made from carbonized wool. The burring machines now in use are not adapted for handling grease wool. The presence even of a very small quantity of

oil or grease makes it impossible to properly burr pick wool in the ordinary burr picker. The manufacturers of the Cheesman wool burrer state, their machine will handle wool in the grease as well as scoured wool.

The most important claim made for this machine, however, is that the fibre is not injured in the process. The working parts of the machine are a roller covered by a fibrous material running in contact with a steel plate over the edge of which the wool is drawn. The burrs and most of the dirt are rolled out by the action of a series of rapidly moving stripper blades, and the wool is delivered uninjured and free from a greater part of the dirt. There is no wool left clinging to the burrs, as with present methods of burring. This means an important saving of waste.

The manufacturers state that the machine requires but two horse power, there are no expensive parts to get out of order, and that the capacity is fully equal to the wool burrers now on the market. The wool run through the machine is delivered in such shape that the different qualities may be easily sorted.

It is not necessary for us to dwell upon the importance of such a machine to the wool manufacturing industry. Every practical wool manufacturer will at once admit that such a machine will effect a great saving in woolen manufacturing.

One of the most important features of this machine is its ability to burr fleece wool in the grease without breaking the fleece so that sorting can be better done after passing through the machine.

—A process for preparing silk waste has recently been patented, and consists in first running the material through a garnett machine. It is then passed through gill boxes and afterwards combed on an ordinary worsted comber. The silk top is then drawn and spun by the regular worsted system. The silk noil, on the other hand, is carded and spun by the woolen system. The silk is boiled off either in the yarn or cloth.

The Memoirs of a Veteran Wool Carder.

I.

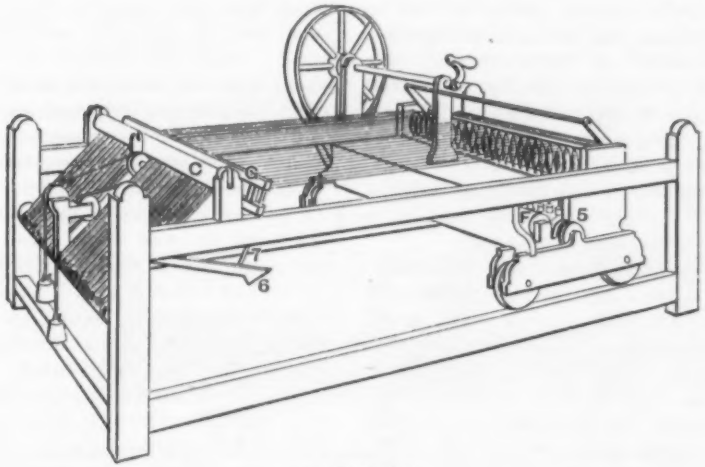
Sam Driver is probably one of the best known carders in the woolen industry. He has been overseer in many of our leading mills and has a host of friends and acquaintances among woolen manufacturers and overseers. His experience goes back to old times and old methods in England and to the golden period of the woolen industry in this country, the war times of the sixties. It is an experience which cannot fail to be of interest to the younger generation of overseers, and alike to his contemporaries, to whom his story will recall many of their own experiences. At our earnest solicitation, Mr. Driver has consented to write his memoirs for the Textile World, and we are sure they will be read with interest. He is in good health and still actively engaged in the mill, filling a responsible position in charge of carding and spinning in New York State. Editor.

I was born in Rochdale, Lancashire, England, a city noted for flannels, blanket and rug manufacturing. My grandfather, Matthew Driver, was a woolen manufacturer, and my father, Sam Driver, and uncles were well known woolen carders, so that it came natural for me to be in the same business. At the age of six or seven years I could be found behind some shed or bush with a hammer and chisel cutting

faces and flowers on paving or cobble stones, and at eight could do very well as a fancy stone cutter. I used to copy from the old churches, faces, etc.

At the age of eight I went before Dr. Coventry, who was then the factory doctor, and passed the examination to go to work as a short timer, to work one half of the day, and go to school the other half, which I did for five years, or until I was thirteen years old, when the doctor passed me the second time.

My first work was as a billy piecer, piecing rolls, which were slubbed into roping and afterwards spun on jenneys or hand mules; many a penny I got from old Susan, who spun on a jenney, for carrying slubbing to her. Billy piecing was one of the hardest jobs a boy or girl could be put to. A man in Yorkshire, Eng., invented a machine to do away with hand piecing; this proved a godsend to humanity, but came too late to save me from being cracked many times on top of the head with the wooden top roller for letting the ends run out. I also have a good recollection of a thick, heavy strap coming in contact with my head and shoulders, and I remember very well the old man who administered this correction, old Johnny a Tummys, a good old fashioned Methodist, who always wore a swallow-tail coat, a white apron and pants that came about half way between his ankles and knees, and sometimes knee breeches. He was a funny old man with a long nose which was always covered with snuff, of which he was always an inveterate taker; but after all he was a good old man. The discipline was strictly maintained in those days. At the age of thirteen I began full time. I was put to feeding one tummer, scribbler or first breaker, and one carding machine where the



A "BILLY."

rolls came out and dropped in the new piecing machine, then came out on spools the same as from a condenser, and went to the billy, thus doing away with billy piecing. In passing through the streets of the city, one could notice a great many men who were knock-kneed from pressing the right side of the leg against the bottom roll.

I fed cards until 18 years old, when I became a full fledged slubber on a billy, earning from twenty to thirty shillings a week, which was counted very good pay for a youngster. Here is where I learned something about wool carding. Each slubber had to do his own carding, and at the age of 20 years I was quite an expert carder. My cards were reclothed with the finest wire, as I had to card the finest

Saxony wool for fancy and plain flannels, cricketers' and army and navy goods. I continued at this work until the 28th of September, 1864. On the night of the 28th (which was Wednesday) after doing my day's work, I told my father that I was going to America. "Well, Sam," he said, I shall never forget the words, "here is ten pounds," (£10); "do what you have a mind with it." I replied, "I am off for America."

On the 30th of September, 1864, I went to Liverpool, and on Saturday the 1st of October, 1864, I set sail on the Inman Line Steamer, "Kangeroo," and landed at Castle Garden, New York, on Monday morning, the 17th of October in 1864, with my carpet bag, tight laced pants, tight hooked velvet cap, and narrow toed shoes or clogs. By the way, I was then a professional athlete, being considered one of the best in England at that time.

Well, after three or four hours waiting, I was examined as to where I came from, etc. I then asked where there were any woolen mills, and they told me Lowell, Mass. I did not know where Lowell, Mass., was, as I had forgotten the geography of America, not having been to school since I was thirteen years old. They directed me via Stonington Line steamers to Boston. I then came out of the garden, and the first man I met was a missionary giving Bibles and Testaments away to immigrants. I had been told not to take any notice of any one when I landed, so I did not take one of his books, putting him down as a sharper, for there were many of them in those days. I met a policeman and he directed me to the steamboat wharf.

I came all alone, had no friends nor even acquaintances in this country, and did not know any towns or cities by name with the exception of New York, Boston and Philadelphia, so all I could ask was: "Where are there any woolen mills in this country?"

I reached the steamboat office, and met people there who had come on the same steamer, but I was told not to make any advances to any one, and I did not. I got my ticket for a deck passage to Boston. It was pretty rough on the sound that night of October, 1864. The deck passage beds were not very soft. They were new boxes apparently, about seven feet long, and some two feet or more wide. Well, quite a number of us sat on these boxes and talked a while, and then laid down on them to sleep. After a while we woke up feeling rather stiff and chilly; we walked around, and when daylight came some one walked up and looked at the boxes. He staggered back and gasped: "We have been sleeping on dead soldiers all night." That was indeed the fact. There were on board the boat that night the bodies of fifty soldiers who had been killed or who had died in the Civil War. It was a grim reminder of the horrors of war.

I arrived in Boston in the morning and found my way to the depot, and arrived in Lowell about noontime on the 18th of October, 1864. The first thing I did was to inquire for the woolen mills, and I was directed to Charles Stott, an Englishman, who owned a mill and who happened to come from Rochdale. I went in the office in the afternoon, carpet bag in hand, and inquired for work. Mr. Stott was in and heard my voice. He said, "Come in and lets look at thee. Where are thy clogs?" I said, "They are in my bag." He said, "Let's look at them." He looked them over, and said: "These are fancy, thin clogs, narrow toes, with brass nails in the toes." He then inquired where I came from, what I did, where I worked, and all about me and Rochdale. This was Charles Stott, the founder of Stott's mills in Lowell. He then sent for the boss spinner, and told him I had been a slubber, could very soon run a jack and make a good spinner, and he told the boss to put me on spare spinning. I thanked him, and the boss took me around the spinning and card room. As I passed the dressers I saw a man I happened to know, but I did not know he was in this country. He asked me if I had

a boarding place. I said, "No." "Well," he said, "you can come with me." So I was very fortunate to begin with.

I commenced work in the morning 19th October, 1864. My first work was helping around the room and trying to run a jack once in a while. At noontime one of the spinners was out and the boss put me on the jack. He said at night I had done very well, most as well as an old spinner. I was pleased and so was he.

(To be continued.)

A New Yarn Scouring and Dyeing Machine.

The machine shown in the accompanying illustrations for dyeing woolen, cotton, worsted, and silk yarn in skeins, will commend itself to practical dyers and manufacturers owing to its simplicity.

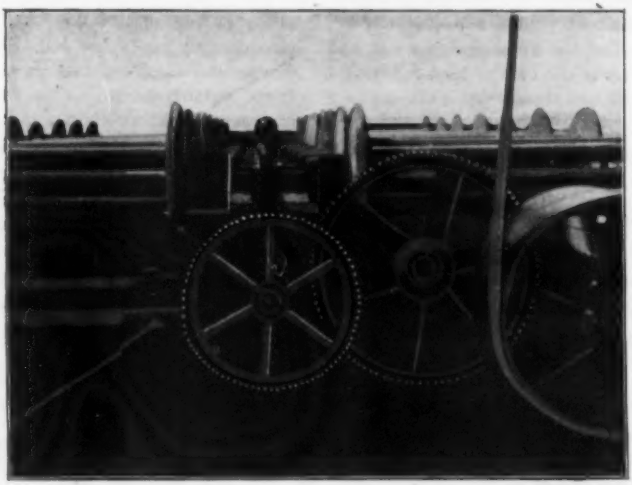
YARN DYEING AND SCOURING MACHINE—WORKING PARTS RAISED.

It is the invention of a practical dyer, who has given the apparatus a thorough test with excellent results. The idea which he has carried out, was to perform with the least possible amount of machinery the operations of handling skeins in the open tub. For this purpose an upper and lower series of drums are fastened to a suitable framework, and on these drums the skeins are placed, so that they occupy the same relative position as when hanging on sticks in the hand process.

The upper series of drums is connected with suitable driving mechanism, and are revolved to keep the yarn in motion. This mechanism is shown in the illustration of the machine with the working parts lowered. When the dyeing is completed the framework is lifted out of the liquor by the crank and gear rack, as shown in the illustration of the tub with working parts raised. The dyed yarn can then be easily removed, and a new batch placed in the machine. During the process of dyeing the work is constantly under the eye of the operator, who can attend to a number of tubs at the same time.

The reels of the scouring machine are made of wood, while those in the dyeing machine are bronze, which resists the action of the chemicals and dyes. Comparisons have been made between this machine and the hand tub to determine the relative production and floor space required. The manufacturers state that with the same size tub over double the quantity of material can be handled and with much better results as to uniformity of shade, and the yarn does not tangle.

The manufacturers state that the cost of this machine is very reasonable, that it produces very uniform work, and requires very little attention owing to its simplicity. It is not liable to get out of order, neither do the working parts deteriorate when the machine remains idle for a time. Neither the scouring nor the dyeing machine requires any special foundation. Further information in regard to it can be obtained from the sole manufacturers, The Automatic Dyeing & Scouring Machine Co., Box 80, Madison Sq. Branch, New York City.



YARN DYEING AND SCOURING MACHINE—WORKING PARTS LOWERED.

An Improved Cloth and Garment Ticket.

Manufacturers of and dealers in textiles will be interested in a new method of ticketing now being introduced by the Saranac Electrical Mfg. Co., Manufacturers of stapling machinery, St. Joseph, Michigan.

Up to the present time, in spite of all attempts to introduce something better, the old form of gum label remains the best method of ticketing textiles. The objection to this method, as is well known, consists in the difficulty of making the tag adhere to the goods so as to resist the unavoidable wear which it is afterwards subjected to. For this reason some form of pin ticket must in the majority of cases be employed.

The pin tickets, now in use, are open to very serious objections. It is practically impossible to fasten them on the goods in such a way that the sharp points will not project, more or less, and consequently they are very apt to stab any one handling the goods; the person applying them to the fabric runs a still greater risk of such injury. They are also clumsy, taking up a great deal of room. The objections to pin tickets now in use are so serious that the trade have to a great extent gone back to the use of the old gum label.

A new tag is offered to the trade by the Saranac Electrical Mfg. Co., which possess the good points of both the gum label and the present pin tag while avoiding their faults. The staple is made of a soft plated steel wire, and is so clinched that the points are turned back into the goods, doing away with all injury while handling.

The ticket is easily removed, as the soft wire staple will straighten out and not tear the fabric. This ticket is applied by means of a tag stapling machine, shown in the illustration, and which drives the staple and clinches it through the ticket and goods at one stroke. The machine is made of the

best materials, and the workmanship is thorough in every respect. All parts subject to wear are made of hardened tool steel. All sizes of tags can be applied with the machine shown in the cut. One stroke of the treadle will feed the wire from the spool, cut it off the proper length, form it into a staple, drive it through ticket and goods and clinch it securely, but in such a way that it can be easily removed.

This machine is made to suit any kind of goods, and to give a flat or oval clinch. It is suited for the thickest as well as the most delicate textures. In fact a number of samples

CLOTH AND GARMENT TICKETING MACHINE.

can be ticketed and bound together by this method.

Some knitting mills use a folded tag for hosiery which laps around the top of a pair of hose. The staple of this new tag passes through the ticket, binds the hose together, and avoids the necessity of sewing toe, heel, or top, to keep mates from being separated.

In addition to the one shown in the illustration, this company has another machine which not only feeds the wire for the staple, but also feeds the tag paper for the ticket and prints the firm's name, price and size in one, two or three different colors of ink. This machine is especially suited for large manufactories or stores where a great many articles are tagged. The cost of the ticketing is reduced to the cost of the paper and wire, as no expense can be counted for printing, which is done at the same time the tag is applied. This machine is built in a very thorough manner, and is operated by the foot.

Further information in regard to these machines can be obtained from the manufacturers, The Saranac Electrical Mfg. Co., St. Joseph, Michigan.

Mill Baskets.

Baskets are indispensable in the mill, and owing to the hard usage and the rapidity in which they wear out form an important item in the general expense of manufacturing. Every manufacturer is familiar with the troubles connected with mill baskets, and these troubles are greatly increased after the basket is partially worn out, and still retained in use.

A mill basket should be not only durable, but light in weight, as they

must necessarily be lifted and dragged around from place to place, and any extra weight adds very materially to the labor of transporting of yarn and other material. Of course, if the question of weight is not involved a durable basket can be very easily found; it is this combination of lightness and durability which is essential.

In the early part of 1897 some man-

ufacturers who were searching for a better basket than they were then using, and who had observed the canvas coal basket manufactured by W. T. Lane & Bro., Port Chester, N. Y., requested this firm to send them sample lots of a special basket adapted for use in the mill. This was the beginning of the mill basket business of this firm, and the first orders were soon followed by larger repeat orders, until today, after the lapse of four years many of these baskets are in use including the first ones sent out in 1897.

The Lane Canvas Mill Basket is

made of extra heavy canvas, stitched with stout seine twine, and reinforced with rivets. The rim is bound with tough leather, the frame is made of high carbon spring steel wire and is so constructed that it projects below the bottom of the basket, preventing any contact between the basket itself and the floor; this bringing the wear on the steel shoes which have been adapted to stand it.

In our illustration of one of these baskets lying on its side, the arrangement of shoe and cross frame is clearly shown. The other cut represents a round taper basket with square bottom and shoes, and shows how the shoes protect the basket itself from wear on the floor. The manufacturers claim that the Lane mill basket will wear many times longer than any other kind now on the market, and that it weighs much less than any other kind. The basket is easily shifted as steel runners offer far less resistance than wooden shoes. It is claimed that the steel runners are practically indestructible.

Most people consider baskets a very unimportant item, and we think that some manufacturers will be found who do not realize the expense incurred for new baskets and repairs to old ones, owing to these charges being included in general expenses. In addition to the money expended, there is the additional expense through the waste and damage to stock, and the loss of time incurred in trying to use baskets that are half worn out or too heavy for mill use.

The following is an extract from a letter received by W. T. Lane & Bro., from the U. S. Bobbin & Shuttle Co., Providence, R. I.:—

"The first sample lot of your Canvas Baskets we received in our factory in May, 1897, and since that time you will note by your books we have purchased over one thousand baskets. The oldest of these commence to show signs of wear, but are still in use.

"Our last examination for repair showed one basket torn and one with handle torn off, the full extent since the Canvas Baskets were installed.

"The repairs of our wooden baskets during the year 1897 cost us over $550, and our total yearly cost averaging at that time over $900. The Canvas Baskets cost us about $400 a year, but will not cost over $300 per year when the full complement has been purchased to replace the wooden baskets that have gone out of service."

Further information in prices can be obtained from the manufacturers, W. T. Lane & Bro., Port Chester, New York.

—Fly wheels have been constructed in Germany by winding a square steel wire on a cast iron spool; it is said that such wheels are run at a surface speed of 10,000 feet per minute with satisfactory results.

The Negro in the Cotton Mill.

Another attempt is being made to employ negro labor in the manufacture of cotton cloth. A negro lawyer, Joseph E. Wiley of Dallas, Texas, is in charge of the latest enterprise of this character, and has interested a number of substantial business men in various parts of the country in his scheme, among them being E. H. R. Green, president of the Texas Midland R. R.; Philip Sanger of the Sanger Bros. Dry Goods Co.; Thos. D. Millen, superintendent of the Gas Light Co. and A. P. Carey of the Carey Dental Supply Co. of Dallas. Among several well known Boston business men who have become interested in the project are C. P. Bowditch and W. F. Hallowell. A mill is to be erected on land known as the Colored Fair Ground in Dallas; this land has been given to the new company by Mr. Wiley. The equipment for a 2500 spindle mill has been contracted for, and work is to be commenced at once.

The attempts thus far made to employ black labor in cotton manufacturing have failed, because they did not take into consideration the necessity for something more than the discipline of industrial enterprises employing white labor; that something is patient training of the negro, not only manually but socially and morally. It is a vast undertaking and one that the ordinary private individual cannot be expected to undertake. The requirements for such a work have been exhibited in a remarkable degree at Tuskegee. The same common sense management of the Dallas enterprise will bring about like results.

—We enjoy seeing the pages of our contemporaries brightened by extracts from our columns, particularly when the Textile World is mentioned either at the beginning, end or in the body of the article. There are some cases where this formality of mentioning the source of the reading matter is omitted, where we still find some slight gratification in the thought that our efforts to instruct are appreciated by others. But when, as in the case of our editorial entitled "From the Fleece to the Garment," copied bodily by the Garment Manufacturer, our reading matter is not only republished without giving us credit, but is displayed in a prominent position under scare headlines and sub-headings, with every appearance of being original with that journal, we feel it is a duty we owe to that paper in particular and journalism in general to call attention to the practice.

Foreign Notes.

—The recent disturbance of business conditions in textile lines abroad has left but one concern in Germany which has paid a dividend of six per cent. In the annual report of this company, they make reference to the business conditions which have existed during the last year, from which we make the following extract, in order to call the attention of our readers to the dangers of the introduction of speculation into legitimate business operations. For years the worsted combing firms of France have confined themselves to a commission business. "In our last annual report we note that by reason of combers engaging in operations on their own account, the business was entering into a dangerous path, and that the profit on commission work done did not afford a guarantee against eventual losses. We have calculated that in our own mill the profits of the last ten years (including the losses and gains made on the small amount of business conducted on our own account which balanced each other), have not exceeded 5½ centimes per kilo. for dividends; 2½ centimes for reserve; and 92 centimes for depreciation of the plant; and, that the results during the same period have not been any better in the case of our competitors. The heavy dividends paid by the large concerns were the result of a gigantic amount of business, in com-

parison with the capital invested, and this concealed the fact that the centimes per kilo., already mentioned, might disappear owing to the losses, which must be calculated by gros sous and which during the past year have actually increased to francs per kilo. These conditions appear to justify us in the note of warning which we sounded at a time when our customers were urging us to engage in large operations on our own account. It has unfortunately been necessary to meet the cyclone, in order to free the combing industry from the vicious influence by which it had become surrounded; vicious, because on the one side the combers have been forced to increase the business done on their own account, and it has thus become more and more difficult to secure commission business. On the other hand, the brokers were less inclined to encourage business for the mills, for the reason that the manufacturers themselves engaged in buying and selling, and thus entered into competition with the dealer."

—The U. S. Consul at Edinburgh, has industriously collected information regarding how goods are packed for the export trade. His remarks on textiles are as follows:

Cotton and Linen Goods. (1) Cases, bales, hampers. (2) Fine goods are put up in cases with a sheet of white paper next them, and packages are wrapped in strong paper; these parcels are put together and inclosed in stout canvas or packing then all are inclosed in oilskin or waterproof paper and packed in a wood case which is either roped or bound with iron hoops.

Curtains (lace). Each pair wrapped in white casing and yellow lining and then packed in a bale covered with waterproof paper and canvas. Large shipments are made in wooden cases lined with waterproof paper.

Flax. (1) Bales, packs, bobbins. (2) The bale is covered with a heavy mat made from the inside of a tree bark cut in strips about half an inch wide and woven together; sometimes press packed, if necessary, to economize space. Exported from Scotland, the bale is commonly bound with ropes made of flax, which perhaps secure it sufficiently.

Jute. (1) Bales, bags, bundles. (2) Bales from India have no covering. The jute and jute tissues are exported from Dundee in the same form as the bales received from India; also from Dundee and elsewhere in bales covered with bagging and hooped with iron. Jute waste is generally in bales or bundles, bound with ropes made of the same material.

Hosiery. (1) Cases, packages, bags. (2) The finer grades of hosiery, as well as gloves and mitts, are put in cardboard boxes and then cased. The coarser grades of knit goods are sometimes shipped in the form of paper parcels, but it is best to first wrap the goods in light oilcloth.

Machinery. (1) Cases, crates, pieces. (2) The best practice in packing machinery—heavy or light—is to firmly fix every piece to the case, either by bolts going through the case, or by battens arranged inside to securely lock the various pieces in position. With heavy machinery, no loose material should be used in any case. The American, as well as the Scotch packing of machinery in general has been on this plan, and is everywhere commended.

Rope. (1) Coils, bales, bundles. (2) Coils and bales are properly covered with a sacking wrapper.

Woolens. (1) Cases, packages, bales. (2) In packing separate lots of various sizes, the method here regarded as best is this: The lengths of cloth are rolled on boards, which are then withdrawn, and several lengths are put together in paper and tied up with twine. The parcels are then packed in a strong wooden case, lined with oilcloth, and hooped round with iron bands. In packing large quantities, each roll is wrapped in thin oilcloth.

—Where justice reigns, armed forces are useless.—Amyot.

COTTON DEPARTMENT.

The TEXTILE WORLD asks practical men to contribute articles for this department. We pay for articles accepted. The acceptance depends entirely upon the value of the ideas expressed. We make all necessary revisions, and urge practical men to contribute, regardless of experience in writing for publication. Illustrations add much to the value of an article, and photographs and sketches are desirable. All communications are confidential, and under no consideration is writer's name published or made known without his permission.

Cost Finding.

BY E. W. THOMAS,
Agent of Tremont and Suffolk Mills.

Second lecture delivered at the Lowell Textile school.

The standard for No. 1 cotton yarn is 840 yards per pound of 7000 grains; consequently one yard of No. 1 yarn weighs eight and one-third grains. To find weight per yard, in grains, any sized cotton yarn, divide eight and one-third by the number of the yarn. To obtain the number of yards of yarn in one pound, multiply 840 by the number of the yarn.

In making out the per cent. of warp and filling in any cloth, the method pursued the other evening was, to find how many ends of warp are in the goods; say 2028 of number 20 yarn. Examine close with a glass a piece of sheeting, and you will find the warp yarn is not in a straight line, but is twisted around the filling, and the filling also around the warp; so that if you take a yard of thirty-six inch sheeting and pull out a thread of the warp or filling, it will be found that this thread is over a yard in length. This extra length of warp would be about eight per cent. in excess of a yard, or nearly three inches; consequently, in a yard of cloth, instead of being 2028 ends of warp, each one a yard long, there is about eight per cent. more than this. Owing to several reasons, all warp yarns do not take up or contract evenly. It is evident that the more picks of any filling that are beaten into the goods with the same warp, the more contraction there is. This is also true where the same picks are put in, but a coarser filling yarn is used.

To illustrate from actual weaving with same warp: (See Table A.)

No. Picks.	Filling.	Warp Contracted.
56	6½s	16 per cent.
56	8s	13 per cent.
56	11s	11½ per cent
56	12s	11 per cent
56	20s	10 per cent.

TABLE A.

To further illustrate by using same filling and same warp with 48 picks: (See Table B.)

No. Picks.	Filling.	Warp Contracted.
48	5¼s	15.70 per cent.
48	7½s	13.40 per cent.
48	8s	14.40 per cent.
48	9s	11.52 per cent.
48	11s	8.80 per cent.
48	14s	10.00 per cent.
48	18s	11.60 per cent.
48	23s	10.00 per cent.

TABLE B.

With the same pick and number of filling in use, different warps, or threads per inch in warp, will result in a difference in the contraction in weaving.

In ordinary goods, the warp is generally coarser than the filling, varying from one to several numbers. The number of threads per inch in the warp, as well as the filling, also, varies considerably. These standards of yards per lb., of the numbers of yarns, and of the widths of cloth, are established generally by the outside markets, and are the creation of fancy, and desire, in many cases. There are, however, certain classes of goods called "Standards," chief of which are Standard Drills, Standard Sheetings and Print Cloths. A converter who prepares goods for others and cuts up large quantities of goods to be manufactured into various articles, often dictates the character of some special goods, or patterns; but the manufacturer rarely ever makes up original goods of fancy or colored patterns of his own volition, his in-

structions as to details being obtained from his selling agents, or their customers.

Bear in mind, also, that all computations relative to costs hereinafter set forth are based on the pound of cloth, and not upon the yard.

	Standard Drills.	Standard Sheetings.	Print. Cloths
Threads, warp per inch	69	56	64
Threads, warp in goods	2,000	2,028	1,785
Threads, filling per inch	48	60	64
No. warp yarn	12½	21	28
No. filling yarn	14	23½	37
Width cloth finished	29"	36"	28"
Width reed	31⅛	39¾	30⅛
Per cent. contraction in weaving	12	10	6½
Grains in one yard cloth	2,456	1,750	1,000
Grains warp in one yard	1,475	875	570
Grains filling in one yard	983	875	430
Yards in one pound	2.85	4	7
Per cent. warp	60	50	55
Per cent. filling	40	50	45
Yards per cut (woven)	40	53½	53½
Pounds per loom per week	110	58.52	35.35
Yards woven per loom	318¾	234	247.45

TABLE C.

The subject of Cost Finding has many phases and methods of computation. The methods that will be presented here tonight are the results of experience, and are pursued today by some mills. It is not claimed they are absolutely perfect, but they seem to me to be the simplest, and, theoretically, the most correct in use. This is my opinion, and I desire the utmost freedom to be used in criticising and in making suggestions.

Tonight, we are to assume that a mill is making three different kinds of goods, and to make the problem clear to you, we will take goods well known in the market, and all of which are now, or have been made by nearly all the mills in Lowell. These three kinds are "Standard Drills," "Standard Four-Yard Sheetings," and "Print Cloths." These cloths will require Nos. 12½, 21 and 28 warp yarns,

Drills	110 pounds per week times 500 looms equals	55,000 pounds.
Sheetings	58.52 pounds per week times 500 looms equals	29,260 pounds.
Print cloths	35.35 pounds per week times 500 looms equals	17,675 pounds.
Total pounds production cloth per week for 1,500 looms		101,935 pounds.

TABLE D.

To get correct percentages of warp and filling in goods, the following method is recommended: Take any ten looms on a given fabric, and weigh accurately the pounds of filling actually used in weaving one cut of cloth from each loom; compare the total weight of the ten cuts with the actual pounds of filling woven into these ten cuts. Taking the pounds of filling from the total weight of cloth, we get the actual weight of the warp yarn, and from these figures the per cent. of each is obtained.

Example: Take ten cuts of drills, 2.85 yards per pound; each cut 40 yards in length; we then have 10 times 40 yards, or 400 yards, which divided by 2.85 equals 140.3 pounds of cloth. Into this cloth we put 56.17 pounds of filling; hence 140.03 less 56.17 equals 83.86 pounds of warp, or about 40 per cent. filling and 60 per cent. warp.

and Nos. 14, 23½ and 37 filling yarns, respectively.

We have quite a range of numbers of rovings and yarns to work with in these cloths, and the methods pursued, and the principles evolved, will serve for us to use for these three varieties as well as for a larger number. To make this plain, I have selected these three grades of goods and made a table, giving the full particulars of each grade, so that it may be referred to as we pass along through the various stages of the working of the cotton, as it passes along through the mill from the bale to the finished cloth. (See Table C.)

We now have before us the classes of goods, of which we desire the cost, and we will assume that these goods are in a mill having 500 looms on each kind of goods, with 26,300 mule and 22,630 ring, spindles.

We have, therefore, the following weekly product from the looms: (See Table D.)

Let us now find what the amount in pounds is that passes through each department. In one of the best mills in New England, it was found that the sweepings, rags, size waste, etc., made after beams were put in looms, amounted to one per cent., which is chargeable to the weave room; the waste in slashing and warping was one-half of one per cent., and in the spinning (warp and filling) was about one per cent. To determine the roving required to give this amount of cloth (101,935 pounds), we must add these percentages; so that the production of the card and spinning rooms will figure on the following basis: (See Table E.)

To get the proper amount of roving required for each class of goods made, multiply. (See Table F.)

So that, to get 55,000 pounds drills in cloth, we must furnish to the spinning rooms 56,430 pounds roving; and for the 29,260 pounds sheetings 30,020 pounds; and for the 17,675 pounds print cloths, 18,130 pounds, making the total required roving production of the Card Room 104,580 pounds.

Now as to the cost of each of the different processes,—Picking, Warp Carding, Filling Carding, Filling Spinning, Warp Spinning, Spooling, Warping, Slashing and Drawing In, Weaving and Cloth Room.

The first is Picking. Here we find that to produce 101,935 pounds cloth, we have expended $122.32 for labor; consequently the cost for Picking is 122,320 divided by 101,935, equals 12, or .012 cents per pound. Were we to take in this case the pounds of cotton actually started through the picker room, viz., 119,917 pounds, and divide the $122.32 by it, our cost per pound would be but .109 cents. We must, however, work on basis of a finished pound of cloth. This amount of cotton (119,917 pounds) required is obtained by dividing 101,935 by .85, which represents the loss in working from raw material unworked and finished product, or practically 15 per cent. loss from bale to cloth. (See Table G.)

Pounds cotton required	119,917
Pounds roving required	104,580
Pounds yarn required	103,029
Pounds cloth woven	101,935

15.00 per cent. waste cotton to cloth.
4.45 per cent. waste cotton to roving.
14.00 per cent. waste cotton o yarn.

TABLE G.

We must now determine the number of roving that is used for the yarns in the various cloths.

For the No. 12½ Warp and No. 14 Filling in the Drills, we will use 1.75 H. R.; for the No. 21 Warp and No. 23½ Filling in the Sheetings, we will use 2.60 H. R.; for the No. 28 Warp in Print Cloths, we will use 4. Hank Roving, and for the No. 37 Filling, we will use 4.50 Hank Roving.

Taking the drills, we have found by previous statement that 56,430 pounds of roving are required for them, then

	Lbs.
Cloth wanted	101,935
Waste in weaving, 1 per cent	1,094
Yarn	103,029
Waste in slashing and warping, ½ of 1 per cent	516
Required from spinning room	103,545
Waste, spooling and spinning, 1 per cent	1,035
Roving required	104,580

Dividing this amount by the cloth woven (104,580 ÷ 101,935 = 1.026) we find it takes 1.0 pounds roving per pound of woolen cloth.

TABLE E.

55,000 pounds drills	multiplied by 1.026 equals	56,430 pounds
29,260 pounds sheetings	multiplied by 1.026 equals	30,020 pounds
17,675 pounds prints	multiplied by 1.026 equals	18,130 pounds
101,935		104,580

TABLE F.

it is evident that 60 per cent. must be for warp and 40 per cent. for filling. (See Table H.)

(To be continued.)

Warp Roving,	= 56,430 times 60%	=	33,858 lbs. of 1.75.
Filling Roving,	= 56,430 times 40%	=	22,572 lbs. of 1.75.
			56,430 lbs.
	Sheetings.		
Warp Roving,	= 30,020 times 50%	=	15,010 lbs. of 2.60.
Filling Roving,	= 30,020 times 50%	=	15,010 lbs. of 2.60.
			30,020 lbs.
	Print Cloths.		
Warp Roving,	= 18,130 times 55%	=	9,972 lbs. of 4.
Filling Roving,	= 18,130 times 45%	=	8,158 lbs. of 4.50.
			18,130 lbs.

TABLE H.

Cotton Comber Noil and its Regulation.

The amount of noil necessary to be removed depends upon the quantity in the lap, and as this is influenced by the condition and production of the cards; when deciding upon the percentage to be maintained these things must be considered and the comber adjusted to remove the least amount of noil consistent with the quality of work desired.

Different grades of stock contain different quantities of noil varying from 13 to 28 per cent.; this percentage must be determined upon and the machine adjusted to remove the required amount; if the comber is not regulated to suit the kind of stock being run, a large percentage of valuable stock will be lost in the noil or a large percentage of noil will be allowed to pass into the sliver.

A comber may be adjusted to remove any amount of noil; in fact, it may be so set and timed that the stock can be run through the machine without its removing any noil whatever, but the purpose of this machine is to take out this undesirable material; where stock is run through the machine and a very small amount of noil removed, the machine has been so adjusted that the needles have not been allowed full play upon the fibres, and in consequence a part only of the noil is removed and a part only of the stock is combed; a practical man is never fooled by those who tell us that they succeed in combing with from 7 to 10 per cent. of noil. To remove this small amount is a very simple matter, but to determine the exact amount to be removed to give the required strength and appearance to the yarn and to take out that same amount from each individual head in the machine and to maintain it under the varying conditions of the work, is an art that requires brains, practice and a close attention to the innumerable details which the above named people sometimes know nothing about.

Any American cotton above the combing length (1¼ inches) is nippy; in order to remove the large amount of nips and all other material that does not go to make up a perfect yarn, close settings must be made. This results in a large percentage of fibres which are below the combing length being taken out along with the nips and foreign matter, and lost in the noil; while if so close setting were not necessary a large number of these slightly short fibres would escape being removed.

One of the ends for which the comber man works, is to save as much of this good stock as is possible; but his first work is to produce a perfect sliver and, if stock is given him that is nippy and dirty, he must sacrifice more or less of the good stock. Peeler cotton is of this class, being difficult to card and comb, and from 18 to 25 per cent. of noil must be expected; to remove the large amount of nips which this stock invariably contains, close settings must be made, and the machine timed to give it every advantage to thoroughly comb the stock.

Egyptian cotton, while clean and easy to comb, generally contains a large percentage of short fibre. Close

setting is not necessary with this stock, but its unevenness results in the production of from 14 to 20 per cent. of noil.

Sea Island is difficult to comb and on this stock a careful and accurate adjustment of the comber is absolutely necessary. 18 to 22 per cent. of noil will be made on stock perfectly combed.

The following methods are given for regulating the amount of noil:

1. The earlier the comb is dropped the greater the noil.
2. The later the nipper is closed the greater the noil.
3. The greater the angle of the comb the greater the noil.
4. The later the feed the greater the noil.
5. The closer the setting the greater the noil.

In practice the first and second methods are rarely used. These timeings should not be meddled with, as it more often results in injury to the work than otherwise. The third plan might be used by a skilful operator, but 28 degrees angle is the rule and can seldom be improved upon. The fourth method can be taken advantage of with safety and the noil varied to the extent of 4 per cent.

By the setting of the nipper knife to the cylinder needles, and the top comb to the segment, the noil is easily regulated; it being quite evident that the deeper the stock is pushed into the cylinder needles as they pass, the greater amount of noil will be removed; while, if the stock is not pressed into the needles to so great a degree, the needles will pass underneath rather than through the stock, and a great many short but valuable fibres will be saved; this, however, will be at the expense of the quality of the work, if this practice is carried beyond the proper limit.

The nearer the comb is set to the segment, the greater amount of noil will be removed, for the reason that more of the short fibres will be held through the comb, and consequently more of the short fibres will be held back to be removed by the cylinder needles on the next cycle of operation; while, if the comb is set at a greater distance from the segment, the fibres will draw underneath rather than through the comb, and a great many fibres escape that would otherwise be removed.

A very important point in the regulation of the noil is the careful adjustment of the nipper. The cushions should be as straight as it is possible to get them; the nipper knives parallel, and nipping the entire length of the cushion; so that the stock will be held firmly instead of being pulled away to be lost in the noil.

The detaching rolls affect the percentage of noil to a considerable degree; those that are uneven or which have been made rough by the use of a poor varnish, that has come off in patches, make an unnecessary large amount.

Where a very heavy lap is used, and the combers are being driven to their uttermost capacity, every advantage possible must be given the needles to do their work well upon the fibres; this would result in a large production of noil, and in order to reduce the percentage without altering the time and set, weight is added to the detaching rolls; 3 or 4 lb. weights hung on each hook answer the purpose well; this is not a common practice, but in mills where heavy production is demanded, it is found necessary.

While the above plan will do much toward reducing the noil, it means ruin to the detaching rolls, and should only be practiced where a wound roll is used, as a cotted roll not being so substantial would be quickly destroyed. When we consider that a great many rolls are run many months after having outlived their usefulness, I think the above plan would answer an admirable purpose in putting out of business those bad rolls that are run in some mills as long as they hold together sufficiently to take a coat of varnish, and which are throwing the manufacturers' dollars into the noil box every day they are run, as the

fibres that escape the detaching roll are generally the best of the stock.

In mills where different grades of stock are run, the resourceful carder will increase the production of his machines, which are running good stock, and reduce on those running the poorer kind; this gives his stock which is difficult to work a great advantage, and unless he is running at top notch speed the good stock will usually stand a little more hustling; his production remains the same, and his quality is improved. This is practiced in mills where Egyptian and Peeler are run.

A little less noil out of the Egyptian and a little more out of the Peeler improves things and no one but the comber need be the wiser of it, a point which is of some importance to many overseers.

CENTRAL.

Long Rolls on Spinning Frames and Mules.

For some time past, cotton manufacturers have turned their attention to the waste question with greater vigor than when competition was not so sharp, and margins of profit were much greater. This economy became more evident about twenty-five years ago, when I was employed as a cutter-off of spare help. Before the ten-hour law went into effect in Massachusetts, the time of the operatives was kept by the day or half day, and if a hand was out for a few hours, no thought was ever taken of docking his pay; but, after the ten-hour law was passed, employers began to keep the time of their operatives by the quarter hour.

Lessons were learned from other manufacturing establishments, where large profits were secured by the saving of by-products which had formerly been thrown away. Great attention was given to every department of our cotton mills, in order that the waste should be reduced to a minimum. This made it necessary that each overseer should pay particular attention to the shape in which the material came into his room, in order that it might be in such a condition that he could perform his part of the work to the best advantage, and with the least possible waste, and deliver the material or goods to the next department in such a condition that a large production of perfect goods would result.

The revolving flat card was a great advance in the art of cotton manufacturing, and was followed by the improved pickers to provide better laps, and improvements in scutching beaters with porcupine teeth. These machines made it possible to manufacture the cotton cloth with much less damage to the fibre. The waste card was also a great step forward, and enabled manufacturers to work waste which had been practically useless. There have been many other improvements, such as the various kinds of stop motions for cards, drawing frames, slubbers, and also both warp and filling stop motions for looms.

In spite of all these great advances, the waste and imperfections caused by slugs and double ends are still with us. I am aware that new frames and mules for fine work are now constructed with rolls for two threads, one on each side of the saddle, thus obviating the difficulty very much, but there are large numbers of spinning frames and mules in use, still in good condition, that have long boss rolls with two threads on each side of the saddle. These rolls will cause double ends and coarse threads, in spite of all the precautions that can be taken by overseers and operatives. The loss is reckoned not only in the waste, but in the imperfect cloth which is produced.

I believe that weavers can do much toward keeping the imperfect yarn out of the filling, because it is possible for a weaver to tell by the feel of the bobbin whether the yarn contains any double, coarse or imperfect ends. The spooler cannot do this as well as the weaver, because in spooling there is not the necessity for such close handling of the bobbins. Frequently a thread will break on the spinning frame and join itself to the next

strand, producing a double thread for a certain distance, and will become separated before the operator has noticed the difficulty. When she does so, the broken end of the thread is simply pieced up and the imperfect yarn left on the bobbin. This is not due to any neglect on the part of the spinner, but is because she has too many spindles to watch.

The warper can do very much toward discovering double or otherwise imperfect yarn in the warps. He knows what kind of rolls are on the spinning frame, and remembers the words of the scripture, "It must needs that offences will come." It is frequently the case that the manager expects the warper to discover and pick out all of the imperfect yarn in the warp delivered to him, but the warper generally has so many extra things to look out for, so many irons in the fire, that he puts this watching out for imperfect yarn into the fire also, and the result is that much bad work goes through into the weave room.

The weaver gets an ear full of the same kind of instruction, as to picking out the imperfect yarn from the warp and filling. He is given to understand that he is paid for making good cloth, and that if there is anything wrong with warp or filling, he must detect it and report, and that under no circumstances must imperfections occur in the cloth; but they do get into the cloth in spite of all the vigilance, threats, fines or discharges.

With all of our improved machines, we still get the double yarn and coarse threads and even fine speeders will cause them, but as the thread is drawn finer on mules and ring frames, the trouble is worse on these machines.

Instead of this futile effort to make operatives discover imperfections in yarn it would be much better to find an ounce of prevention for the imperfections. Many ring spinners, as well as mule spinners, have had this question in their minds for years, but no one has as yet found a remedy that is not open to serious objections, The devices are too complicated, expensive, or are in the way of piecing up, cleaning and oiling the machines.

PAUL.

Best Size of Spinning Ring for Different Sizes of Yarn.

The recent improvement in ring spinning on coarse numbers, say from 10's to 30's, with from 2-inch to 2¼-inch ring, and 6¾ to 7½-inch traverse, makes it somewhat of a problem to know if these sizes can be used for the finer numbers of yarn. Not many years ago, the idea of a ring over two inches in diameter, with a 7-inch traverse, on coarse numbers, was ridiculed, and now all who are putting in new machinery order the large ring and long traverse.

In a great many cases, where machinery is not too old, the large ring and long traverse is being substituted. I remember fifteen years ago it was thought impossible to spin 50's on rings larger than 1¼-inch, and 5¼-inch traverse. Then, a sixteenth of an inch was added at a time, until now it is quite common to find 50's run on a 1⅝-inch, and in some cases, 1¾-inch ring, with a 6¼-inch to 7-inch traverse. I have several thousand spindles on 50's warp yarn, with 1¾-inch ring and 6½-inch traverse, which were changed over from 1⅜-inch ring and 5½-inch traverse, and they run very well; in fact, I think they run equally as good as did the small ring and short traverse.

This use of large rings and long traverse does away to a very large extent with spooler's knots, one of the greatest evils in a cotton mill. I believe, however, that 1¾-inch ring and 6½-inch traverse mark the limits for yarn from 45's to 50's, because when the bobbin is too heavy and spoolers are going at a good rate of speed, there is considerable breaking back, and this increases the spoolers' knots.

The saving in knots is not by any means all that is gained by the use of larger rings. There is a direct and

very large gain in the cost for spinning and spooling. In a room of, say, 20,000 spindles, on 50's yarn, 1⅜-inch ring and 5½-inch traverse, 6 doffers and 18 spooler tenders would be required; with 1¾-inch rings and 6½-inch traverse, the doffers could be reduced to three and spooler tenders to 13, a saving of eight hands, whose wages average 95 cents per day, which would make $7.60 per day saved for say 300 working days, or $2280 per year. It would cost about 50 cents per spindle to make the change which for 20,000 spindles would be $10,000, and at that rate the change would pay for itself in 4½ years.

There would be a great deal larger production from weave shop, and a better quality of cloth. Production in spinning department would be increased somewhat by less stopping to doff, and in a coarse mill, where they doff often, this would be quite an item. I will give you what in my opinion is the limit in size of ring and length of traverse for good work.

20's to 30's	2¼	inch	ring	and	7	inch traverse.
30's to 40's	2	"	"	"	6¾	" "
40's to 50's	1¾	"	"	"	6½	" "
50's to 60's	1½	"	"	"	6¼	" "
60's to 70's	1½	"	"	"	6	" "
70's to 80's	1½	"	"	"	5¾	" "

This is, or should be, a very interesting subject to most mill men, and I would like to learn through your valuable paper the opinion of other spinners.

MOHAWK.

Lustring and Stiffening Yarn.

A process has been patented in this country by a resident of Switzerland, for giving yarn made of vegetable material stiffness and a silky lustre.

If yarn or fabric be first passed through a bath of dressing material, such as boiled or raw starch or gelatin, then wrung out, then impregnated in any suitable manner with a concentrated solution of soda-lye while spread out and under some tension in order to prevent shrinkage of the fibre, and finally washed while still stretched or under tension, it will be found, says the inventor, that the material so treated will be more or less stiff and have a silky lustre, this condition varying somewhat according to the quantity of dressing employed and the strength of the lye employed.

He states that if the solutions employed are concentrated, fibrous products are produced having the hardness and stiffness of wire thread. For example, in order to produce yarn or thread which is hard and wiry and to impart a silky lustre thereto, the yarn or thread may be first passed through a solution of boiled starch, then wrung out and spread, then treated while stretched or under tension with soda-lye of 20° Baume, and then washed while still stretched, first with water, then with dilute acid, and then again with water. The goods should be dried while under tension.

—A correspondent of the Cotton Factory Times states, that a 24,000 spindle cotton spinning mill has lately been started on 36's in Belgium. The mules run at the rate of three draws in forty seconds. There are three piecers and a minder to each pair of 1200 spindle mules. The minders earn $5.40 per week, the big piecers $3.50 per week, and small piecers $2.30 per week. Other helpers make the total cost for labor per week for operating a pair of 1200 spindle mules $12.55, as compared with $18.86 in England.

—It is necessary to resign one's self to growing old; it is the only means of living a long time.—Auber.

—Those who read, know much; those who observe, know something more. —Dumas.

—The wicked are in the world to try the patience of the good.—St. Augustin.

—A wise man sees the difficulties and surmounts or avoids them; the stupid do not realize them.—La Bruyere.

WOOLEN DEPARTMENT.

The TEXTILE WORLD asks practical men to contribute articles for this department. We pay for articles accepted. The acceptance depends entirely upon the value of the ideas expressed. We make all necessary revisions, and urge practical men to contribute, regardless of experience in writing for publication. Illustrations add much to the value of an article, and photographs and sketches are desirable. All communications are confidential, and under no consideration is writer's name published or made known without his permission.

Finishing Wool and Mixed Fabrics.

BY M. REISER.

II.

BROAD CLOTHS WITH A PLAIN WEAVE.

(Translated from the German for the Textile World.)

(Copyright.)

Low grade piece dyed broad-cloths woven with a plain weave are first burled and sewed, then weighted and measured, after which they are fulled in the grease with soap and a 3° or 4° alkaline solution. They are then scoured, washed with fuller's earth, and thoroughly rinsed. The goods are now carbonized, if this is required, and neutralized.

These low grades are generally taken direct to the double gig, omitting the preliminary gigging, which is given to the finer grades of goods. Dull work is used at first in the gigging. During this process the cloth is kept wet in order to soften the fibre; this is an important point, and the goods should be kept moist until the gigging is completed. After the nap has been sufficiently raised by running the two cylinders in opposite directions, one cylinder is thrown out of use, and the gigging continued with the other one. Later in the process both cylinders are used running in the same direction. Frequently the gigging is done on a single cylinder machine, but in such cases it is necessary to use much sharper work.

The pieces are now extracted on a cylinder machine, dried, back burled, brushed and given eight or ten runs on the shear. They are then steam brushed, pressed twice in the hydraulic press, steamed on a roll for fifteen minutes, and left to cool on the roll. The goods are now all ready for coloring. When colored they are rinsed in clear water or fuller's earth, according to the nature of the color. They are then given six or eight runs with dull work on a wet gig. During the last run the roll is kept covered with water; they are then extracted, dried, back burled, steamed, and sheared. The goods are first sheared lengthways, and then the shearing is completed on a cross-cut machine.

The goods are now run through a cylinder press, and afterwards pressed twice in the hydraulic machine, or in a stichpresse (stichpresse is the name given to a press used in Germany in which the goods are folded either with or without press papers and subjected to a moderate weight which serves to keep the nap in position, but cannot be called pressing as the term is usually employed).

Another method of handling low grade piece dyed broad-cloths consists of scouring, drying, burling, sewing, measuring, and weighing them, in order to determine what amount of shrinkage in fulling is necessary. The goods are then carbonized, neutralized, dried, and fulled as required. They are then given a preliminary gigging, dried, sheared, and cropped carefully, wet out, extracted, and gigged on the double cylinder machine. After gigging they are rinsed about an hour, brushed on the wet gig, extracted, dried, burled, cropped, and wound on rolls which are first covered with cotton cloth. The goods in this condition are then placed in hot water (70° or 80° C.), and left for about two hours;

at the end of this time they are rewound with the ends reversed, and left in the hot water for another two hours. The cloth is then run through a cooler, rinsed, brushed on a wet gig, dried, and given several runs on the shear, and then colored.

They are then rinsed, brushed on the wet gig, dried, buried, steamed on both back and face, and the shearing completed. They are then pressed twice in the hydraulic machine, steamed on rolls for ten minutes, wet-out, brushed on the wet gig, dried, steamed on back and face, given two cuts on the cross cut machine, and then brushed.

The goods are then rinsed, brushed on the wet gig, dried, and the shearing completed. If the goods are dyed red or any other bright color, nearly all of the shearing should be done before coloring, because shearing after coloring gives the goods a gray and undesirable appearance. After the coloring the goods must be rinsed, extracted, and the nap straightened on the wet gig, but during this process the goods should not be very wet, otherwise the color will become dull.

In finishing wool dyed broadcloths woven with a plain weave, the goods are first buried, sewed, measured, weighed and scoured. They are then extracted, dried, and again buried, and sewed. It would be better to weigh and measure the pieces after scouring, as there is more or less loss of weight in scouring, and consequently the required shrinkage will be determined more closely when the goods are clean.

After fulling the goods are rinsed, and when all the soap has been removed, they are treated to a solution of fuller's earth, and afterwards well rinsed. If any wrinkles appear, the goods are washed in a full width washer. If the wrinkles are very pronounced, the goods should be crabbed, but the temperature of the water should not be over 40 or 50 degrees C.

The preliminary gigging is now done on a small gig, and the goods are then dried, and carefully cropped on the shear; they are then wet-out and put on the double gig; dull work is used at first, and gradually sharper work is introduced until the gigging is completed. They are then put on the wet gig, and the nap well brushed while the goods are running in water. They are now wound on rolls and left in this condition for about six or twelve hours, the ends of the rolls being reversed occasionally; then they are dried, back buried, brushed, steamed, and partially sheared. The goods are then pressed twice in the hydraulic machine; the press plates must be so hot that a blue flame is produced when a piece of sulphur is applied to them.

They are then steamed on rolls for fifteen or thirty minutes and wet out in the washer; they are then put on the wet gig and brushed while running in the water; then extracted, dried, steam brushed and the finishing completed. The goods are now specked with India ink; and, according to the appearance desired, are either hot or cold pressed. If hot pressing gives too much lustre it should be partially removed by steaming. Owing to the great strain on the yarn when weaving goods with a plain weave, most of the broadcloths with this weave are piece dyed, as a stronger warp can be spun from gray stock.

(To be continued.)

—Some months ago we called attention to a process of producing mixed effects in piece dyed goods by using mixtures of mordanted and unmordanted wool or top for making the yarn. This process is the subject of a recent U. S. patent. Such a method is open to the objection that the mordant on the fibre will lose its efficiency during the long process of manufacture.

—An alert mind is of no great advantage, if not accompanied by good judgment. The perfection of a pendulum consists not in speed, but in regularity. —Vauvenargues.

Estimating the Cost of Woolen Goods.

(Continued from May.)

In the May issue we outlined a method of cost calculation for woolen goods. Before considering the question of estimating cost of individual fabrics, we wish to call attention to the first statement in accompanying table, in which the production taken from the monthly report on page 898 of the May issue is reduced to the equivalent yardage of a fabric containing 50 picks per inch, which has been taken as a basis for our calculations.

The monthly production was 74,250 yards, 36 inches wide. As these goods are woven two widths in the looms, the actual yardage woven was one-half of this amount, or 37,125 yards, 36 picks per inch. Assuming these looms to have been operated with the same efficiency on a cloth having 50 picks per inch instead of 36, a proportionately less yardage would result; 26,730 yards of 50 pick goods is this equivalent.

As stated in the former article, this reduction of the product to a constant equivalent is made for the purpose of having a standard measure of the production by which to calculate the average cost per yard of the so-called fixed charges, and to better compare the product of different months; in other words, one yard of goods containing 50 picks per inch is taken as the yard stick by which we measure the work of the mill.

Two important items of cost do not appear in our statement, viz., interest and depreciation of real estate and machinery. They have been omitted because they vary so widely among different mills, but care should be taken to allow for these charges in estimating the cost of goods.

Not all of the items grouped under the head of fixed charges are, strictly speaking, fixed; they might more properly be termed general expenses that should be charged to every yard of goods produced in the mill.

A mill may be making both woolen and worsted goods, buying raw stock for the former and worsted yarns for the latter. Such charges as wool sorting, scouring, carding and spinning belong exclusively to the woolen goods. The expense of office, repairs, fuel, insurance, taxes, interest, etc., should, however, be charged to both woolen and worsted.

Having calculated the general expenses on a basis of 50 pick goods, we find that the cost per yard of 50 picks for these items amounts to 4 7/10 cents for labor and 4 2/10 cents for expenses other than labor.

We now come to the problem of estimating the cost of individual fabrics. Referring to the estimate in the lower half of accompanying table, we find that for each department or process of manufacture the quantity of material has been calculated that must pass through the department to make one cut of cloth 47 yards long when finished. For instance, 156 lbs. of grease wool must be sorted, 63 lbs. clean wool must be scoured, colored and picked, 221 runs of yarn must be carded and spun, 7 section cuts must be spooled and warped, 50 yards of cloth must be woven, and 47 yards finished in order to complete the manufacture of one cut of the cloth.

We take each one of these items and extend it at the average cost for the department in question. The fixed charges are based on the woven yard. In the case taken as an example the fabric contained 50 picks; consequently, we take the average from the statement at top of table. If the number of picks per inch had been other than 50, say, for instance, 40, the fixed charges would have been extended at 4 3/10 cents for labor, and at 3 4/10 cents for expense, or at a decrease proportionate to the reduction in number of picks per inch.

On the other hand, if the picks had been 60 per inch, the 4 9/10 cents for labor and 4 2/10 cents for expense would have been increased in like proportion to 5 9/10 and 5 cents respectively.

After the cost for various processes and fixed charges have been calculated by this method the totals are added together; in the example given they amount to $12.49 for labor and $5.48 for expense per cut. The cost per finished yard is estimated by dividing each of these totals by 47, the number of finished yards in a cut, and the results thus obtained are added to the estimated cost of stock. This last total is the estimated mill cost per yard.

The claim is not made that this par-

Monthly Statement of Fixed Charges.
of a 12-set woolen mill on Dress Goods,
36" wide — 36 Picks

74250 yds., 36" goods, 36 picks = 26730 yds. full width, 50 picks

Dept.	Product	Labor	Expense	Average per yard, Labor	Average per yard, Expense
Weaving	26730 yds	334.60	57.98	.02	.002
Repairs	"	155.92	51.98	.006	.002
Int & Tax	"		371.25		014
Fuel	"	80.19	348.98	003	013
Freight	"		133.65		005
General	"	482.62	155.92	018	006
		1253.33	1113.76	.047	.042

Cost Estimate of Woolen Cassimere.
15½ ozs. per yard, 6/4.
2800 Ends, 3⅞ Runs; 68" wide in loom; 50 picks, 3⅞ runs.
Stock shrinks 15% from clear wool to yarn,
15% " yarn to finished goods.

21 7/10 ozs stock required for yard 42 lbs. .562 Cost of stock

Manufacturing

	Required per Cut	Average Labor	Average Expense	Cost per cut Labor	Cost per cut Expense
Sorting	156 lbs	.0014		.22	
Scouring	63 "	.0034		.21	
Coloring	63 "	.004	.03	.44	1.89
Picking	63 "	.002	.003	.13	.19
Carding & Spin'	221 "	.01	.001	2.21	.22
Spool'g Drawing	4 Sections	.056		.39	
Weaving-Piece	50 yds	.089		4.45	
Finishing	47 "	.036	.023	1.69	1.08
Fixed	50 "	.049	.042	2.35	2.10
				$12.49	$5.48

Cost Stock per yard .562
$12.49 / 47 yds " Labor " " .266
$5.48 / 47 yds " Expense " " .116
Mill Cost per 6/4 yd .944

ticular method is the best that can be adopted; it has, however, been used with satisfactory results in a mill making kerseys, friezes, fancy cassimeres, fancy cheviots, fancy worsteds and piece dyed woolen and worsted serges.

Most mills are handicapped by having too many fabrics in process at one time. This condition seems to some extent a necessary evil, and under it the question of cost estimate necessarily becomes very intricate.

FEDERAL.

Large and Small Woolen Mules.

THEIR COMPARATIVE MERITS.

The decision of a manufacturer, as to whether to adopt large or small mules for his work, might not depend solely upon the general merits of the machines, and yet seem to be the best in his individual case.

The room in which the machines are to be placed, might reasonably have a bearing upon the decision to some extent, as a matter of convenience or economy of space; added to this, the kind and quality of work to be done upon the machines might have a bearing.

When we say that the small mule will do all that the large mule can, as well as some that it cannot do successfully, we at once show our favor for the small machine. There are kinds of work that can be done as profitably and as well upon the large as upon the small mule, and were the manufacturer sure of continuing on that particular class of work, he could safely decide upon the use of the former. There are, however, few mills that are reasonably certain of running continually on one class of work, and for this reason we are forced to conclude that the mill that is the best equipped for a variety of work, may fairly be considered as having the advantage of those whose capacity is limited by the limitations of any one or more machines; hence, to do the subject justice, we must consider it from the standpoint of what is the best and most profitable for a variety of work, both as regards quality of stock and size of yarn to be spun.

In discussing this matter, we must do it upon the supposition that each machine is set up and arranged to the best advantage, which means the small mules set in pairs facing each other, as against the large one by itself; considering the small machine as having from 220 to 320 spindles, and the large one as having 420 or more.

The possible saving in the first cost of the machines is a small matter, as compared with after considerations: and the man who jeopardizes his interests by overlooking or undervaluing the importance of the quality of his production for the sake of a small saving in equipment, may, when too late, discover the folly of his "penny wise and pound foolish" policy.

We can cite cases where the large mules have been adopted because it was impossible to place a pair of machines in the space allowed, and the decision turned wholly upon the desire to instal the largest number of spindles possible within the limited space. Such a decision, though possibly wisely decided upon, does not come within the scope of our present considerations.

With the variety of work which the American mills are called upon to do, and the quality of work which the sharp competition forces upon them, it is by all means the wisest policy to adapt the mill to meet the conditions, and to the thoroughly practical spinner, it is plainly evident that the smaller mules set in pairs, is the best, safest and cheapest arrangement that can be adopted with the machines of the present time.

As regards the labor cost, it is doubtful if there would be much difference upon work that would run well upon both machines. If a mill were running on a good grade of all-wool stock, a pair of 220 spindle mules should be run by one man, and a large mule of equal capacity would also re-

quire one man, though possibly his work would be harder to watch.

Should the work be such as to require a man and a piecer, or two men in one case, it would also require the same in the other, though it might require more attention on the large machine, from reasons which we shall endeavor to make apparent. It will be seen, that as regards the labor expense, independent of any other considerations, the difference would not be worthy of consideration, so long as the capacity of the machines were about equal. But upon some kinds of work, the capacity would cease to be equal, owing to the better adaptability of the smaller machine for the work.

Following are some of the chief advantages referred to. Upon very fine yarns, on large mules, there is a strain upon the work that is sure to act unfavorably. This is on account of the extra weight of the machine, and the additional power required to operate it. The difference would only be noticeable upon fine yarns or tender stock. But on this score alone, the smaller mule would do better work by running with less breakages. Upon coarser yarns, or with a better quality of stock, the difference in this respect would not be so marked.

For handling low stock, the large mule is largely at a disadvantage, not only on account of extra strain already referred to, but because of the consequent stopping of the machine to mend ends, together with the necessary stopping to change spools, etc.; in such cases there are more spindles idle while the carriage is standing than is the case with the small mule.

Aside from this, the spinner has his work more closely under his observation when he stands between two small mules, than if the same number of spindles are extended in one continuous line, as upon the large machine.

A thoroughly practical spinner who has both the large and small mules under his care, evpressed himself to the writer regarding this matter as follows: "On good stock, the large mules work fairly well, but on bad work they are a failure, as the spinner cannot keep them going, and I plan to put my best work on the large mules, and so get along with them, whereas I would be handicapped if I had to depend entirely upon the large mules for all my work."

Another advantage of the small mule, especially in a mill upon fancy work, is their convenience in handling small lots. It has also been demonstrated that when the machines get to that point where their parts begin to wear out, it costs more for repairs upon the larger machines.

Any one at all familiar with spinning, understands the good influence that a light, easily running machine has upon the running of the work. This alone is an important factor in favor of the small mule, and when it reaches that point in capacity as regards spindles where it runs heavily, it begins to lose that feature which is of the greatest importance. Adding to the advantage of its light and easily running qualities of the small machine, that of keeping the largest number of spindles moving the greater proportion of the time upon low stock and fine yarns, it seems that the small mules stand far ahead in their capacity to turn off quality and quantity upon all kinds of work.

To do the work for a 40-inch card delivering two twenty end spools, a 220 spindle mule does very satisfactory work. For 48-inch cards delivering two twenty-four end spools the mules may have 312 spindles; but we would not advise more.

The floor space and other considerations which would come in question would influence the manufacturer, but he will do well to consider the advantages of the lighter machine over the heavier before making his final decision in the matter.

ELMO.

Editor Textile World:

I have been interested in the article on length of woolen mules, which ap-

peared in the May issue, and, as I have had some experience in the spinning department, I will give you my views on the question.

I would rather have a 300 or 320-spindle mule and 2¼-inches gauge than any other size. My reasons for this are that they run more steadily, and a good spinner can keep the work up better. You take a longer one, and it is hard work to keep the work up for one spinner, and you make poor work and lots of waste on the bobbins, and much of the batch is on the floor. If you use a larger size gauge, then after the machine has been run a while the collar boards will get worn and the spindle will shake. It is then impossible to get a nice smooth yarn; the large mules make a lot of waste when you run out lots, for it is a hard job to even them up, unless you have a place to split the spools of roping.

Now as to small mules; you take a 200 or 220-spindle machine and you must have two of them, and it will cost you double for repairs of all kinds. When a spinner drops one of the machines, he sometimes lets it run one or two draws longer to try to get up all the ends that are down on the other, and in that case he lets his tension faller get too low, and you have 200 or 220 twits in one draw of yarn.

I have read with considerable interest the article on the "Comparative Merits of Large and Small Woolen Mules," and will give you my opinion, based on considerable experience with both sizes.

I would recommend a 312 spindle mule with a 1¾-inch gauge for yarn running from one to seven runs. On yarn above seven runs, I think a 360 spindle mule could be used, as the fine numbers usually spin better than the coarser sizes, and the spinner would consequently be able to look after more ends. A spinner cannot attend to two small mules and do good work. He can do more and better work on one 312 spindle mule than on a pair of 212 spindle mules. On the finer work the pair of small mules might be used, but I should prefer one large mule. A 1¾-inch gauge is better than a wider gauge, as the machine can be run at a higher speed.

KING PIN.

—Some time ago there was much agitation in Yorkshire over the weighting of worsted cloths. Public meetings were held, and an organization, called the Yorkshire Worsted Association was formed, for the purpose of abolishing or restricting the practice. The movement has amounted to nothing. The association has found that it is impossible to accomplish anything in this direction, as the buyers of goods insist on having goods filled. It was impossible to resist the demand coming from this source, and the practice of weighting worsteds continues in England as heretofore without any serious attempt to restrict it.

—Generosity is innate; the sense of justice is acquired by experience. —Lamartine.

—Some men are opposed to all counsel except that which they themselves give.—De la Roche.

—The merit of a stranger is more often appreciated than that of a friend.—Fournel.

—In laughing at the sallies of the vicious, a man comes very near to being one of them.—d'Houdetot.

—The requisite of success is not so much ability as lack of scruple.—De Bruise.

—Repent and begin again. This is life.—Cherbuliez.

—The anvil does not fear the hammer.—Anon.

—A woman's heart is both her friend and her enemy.—Houssaye.

KNITTING DEPARTMENT

The TEXTILE WORLD asks practical men to contribute articles for this department. We pay for articles accepted. The acceptance depends entirely upon the value of the ideas expressed. We make all necessary revisions, and urge practical men to contribute, regardless of experience in writing for publication. Illustrations add much to the value of an article, and photographs and sketches are desirable. All communications are confidential, and under no consideration is writer's name published or made known without his permission.

Knit Goods Situation.

Considerable improvement in the condition of the underwear market has been noticed during the past few weeks and prices on men's fleeces seem to have at last settled down to a firm basis, and no more fluctuations are looked for.

Early in May considerable excitement among manufacturers and buyers was caused by the action of one of the largest manufacturers of fleeced goods in the country, who cut his price to $3.25; most of the other large manufacturers met this price and notified their customers that they would guarantee the new price; but within one week after this cut the whole situation was changed and the downward tendency checked by the action of the representatives of some 35 mills who met in Albany on May 7th and unanimously agreed to adopt the following new schedule prices.

No. 1, 20 gauge, 12 pounds fleece on 40 inch shirts, cotton, galloon or Prussion binding, $3.50 net. No. 2, 22 or 24 gauge fleece, 12 to 13 pounds, on 40 inch, same trimming, $3.62½ net. No. 3, 22 and 24 gauge, 14 pound fleece, 40 inch shirts, silk or galloon binding, crochet edge, $3.75 net. No. 4, anticipation at a rate not to exceed 6 per cent. per annum, all bills to be dated Oct. 1, all freights f. o. b. mill. No. 5, all mills agree unanimously to reduce the working hours, beginning May 13th and to last until July 1st, so that the working hours will not exceed fifty hours per week.

By this agreement it will be seen that the price of standard fleeces has been restored to $3.50 and the working hours of the mills reduced to fifty hours per week; this curtailment to take effect May 13th and to continue until July 1st.

Reports received from various sections of the country indicate that retail underwear stocks are being reduced and all that is required now to create a strong demand, is a few days of good, warm, seasonable weather, and duplicate orders will pour in. Business on ladies' ribbed goods, both plain and fancy, has been extremely satisfactory and it is very gratifying to note that there has been a strong tendency towards the buying of better grades. Manufacturers of ladies all-silk and silk-plaited vests have more orders on hand than they can take care of and are considerable behind on deliveries.

The various lines of linen mesh underwear are in stronger demand this season than ever before, which fact is undoubtedly due to the persistent and extensive advertising by the manufacturers of this class of goods, whose strong argument is that the linen garment from a hygienic standpoint is the only proper one to be worn next the skin, as it quickly absorbs the moisture from the skin and gives off this moisture to the atmosphere more readily than any other known fabric. The principal objection to this garment becoming a popular article of clothing is that it is very expensive and by no means as durable as a cotton or wool garment, which can be purchased for one-half or even one-third of the price of the linen mesh article.

A marked improvement may also be noticed in the hosiery business, and existing conditions point toward a good season. Many buyers were at-

tracted to the New York market early last month by the auction sale of hosiery and gloves held by one of the largest importing and domestic hosiery houses for the purpose of reducing stock, and it was a note-worthy fact that some lines put up at auction brought actually higher prices under keen bidding than the same identical goods had sold for at private sale a day or two previously.

The Chemnitz market is still fairly brisk, with the mills running on full time but not quite so many or such large orders on staples as is usual at this season of the year. Wages are lower but the high price of yarns maintains the price on hosiery. Split foot hose are in great demand and orders cannot be filled as promptly as buyers wish for, more particularly on the lower end of the line, costing M. 4/50 and upward.

Polka dots are not in much demand, but extract goods in small figures and vertical stripes will be stronger than ever according to present indications. Figures 1 and 3 represent three neat and effective styles which have sold very well. Figure 1 is a neat bow-knot pattern on a black cotton corduroy rib. Figure 3 shows a vertical effect in white on a plain black stocking. In Figure 4 is shown an arrangement of polka dots which has met with considerable approval. This is a colored stocking of fine quality Maco yarn in pastel shades, with a white extract pattern of graduated polka dots.

Lace effects and combinations of lace and embroidered patterns will undoubtedly be a strong feature of the coming season. Figure 6 represents a very handsome style in fine Lisle, lace effect, vertical patterns which have sold readily at $4.25; while Figure 7 shows a stocking made from the same fine lisle yarn but in a Richeleau rib effect, with a danty pattern embroidered in red silk on the instep.

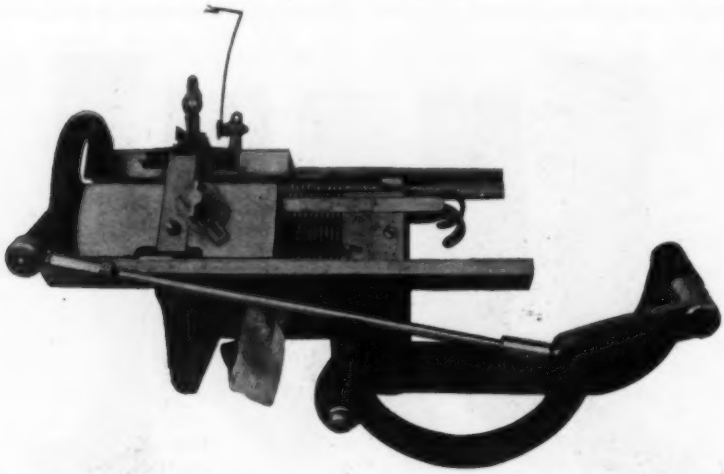
FIG. 7. FIG. 1. FIG. 4. FIG. 3. FIG. 6.

There is no question now but that fancies will be good for another season; extensive lines of novelties and attractive patterns are now in course of preparation, and samples will soon be shown. Nothing definite seems to be known as to which will be the popular colors of the season, but, red, Yale blue and royal blue will be good, and a shade of light green seems to be regarded favorably by some American buyers. Purples will not be touched at all by buyers from this market.

—He who will not feed cats, must support mice and rats.—Anon.

Knitting Machine for Fingers of Gloves and Mittens.

The accompanying illustration shows a machine which has just been placed on the market by Stafford and Holt and designed for knitting glove fingers. It is constructed according to the most approved principles, such as: short carriage, telescoping jacks, automatic locks without carriage stops, and fixed thread guides, making the machine very simple, handy and durable. The best materials are used throughout the machine which is built in any gauge desired. The cams are made of the best tool steel, and are ground after tempering. The plates are made of a special grade of steel accurately cut and finished, and all parts are interchangeable.



Further information in regard to this machine can be obtained from Stafford & Holt, Little Falls, N. Y.

—Acetylene is coming into general use in Alsace for lighting dye houses and print works. It is said that under this light the shades have the same appearance as in sunlight, and the difference in appearance caused by gas and electric light is avoided.

—To be stupid is the right of the talented, and the duty of the stupid.—Roqueplan.

Steaming Knit Goods.

It is not claimed that steaming knit goods is a substitute for washing or bleaching. It is rather a supplementary process, the principal effect of which is the softening of the goods, and for fine knit goods it is unexcelled. Even after the goods have been thoroughly washed, bleached, colored, or tinted, there still remains a certain amount of foreign material which gives the fabric a stiff, harsh feel. It is this last residue which is removed by steaming, and with its removal disappears the harsh feeling referred to, and the goods become pliable and soft to the touch. They acquire a lofty handle, which makes them much more desirable. This I know from experience.

In the case of many colors, there is a certain amount of loose dyestuff on the fibre, which is very objectionable, if left in the garment. This is completely removed by the steaming process, and if the colors are such as will stand the steam, the shades are brightened by having this loose residue removed.

Sometime ago, I advised a manufacturer of fine underwear to adopt this steaming process in the finishing of his goods, which were for infants' and

children's wear. This was done, and the improvement in the goods was so marked as to be followed by a large increase in the sales, and the manufacturer could not now be induced to abandon the method.

While steaming is especially well adapted for high grade goods, it is of great advantage on medium and lower grades; but, of course, it entails some expense, and, consequently, it is not as well suited for these lines. The goods after being thoroughly washed and rinsed, if no bleaching or coloring be required, may be extracted, then put in the steam house or chest and steamed for thirty to forty minutes. They are then extracted as hot as possible, and dried at a moderate heat. If any reader of these lines doubts the improvement which this simple process will effect, all he has to do is to fix up a temporary arrangement in which to steam a trial lot. "The proof of the pudding is in the eating." I believe that I was the first one to adopt this process.

The apparatus required is very simple. The size of the box should, of course, depend upon the quantity which it is required to treat at one time. The steam chest is best adapted for white goods, such as hosiery, infants' and children's small underwear, etc., while a small building is necessary for colored goods, and will answer equally well for white goods. The chest can be made with a removable cover. Iron rods project above the edge of the box, one at each corner, and if the box is large, one in the centre of each side. These bolts fit into holes in the cover provided for that purpose, and are threaded with a coarse thread, say eight or ten to the inch. The cover should not be less than two inches thick, and is fastened by thumb screws at each bolt.

Trays supported on wooden cleats are placed inside of the box. These trays should be made of copper, or some material that will not rust. Nail heads should be excluded from the inside of the box, otherwise rust will damage the goods. If the chest is large, it is better to make it with a solid top and removable side, built to run on rollers; when soaked with water, it is very heavy. The bottom should be made a trifle lower at one end, so that the condensed water can be collected and discharged through a drip pipe. The steam may be introduced through a short length rubber hose, which can be easily attached to steam pipes in various parts of the room.

If a house is built, in which to steam the goods, it should be constructed on the same plan as a bleach house. Trays or shelves are built for supporting goods, or they may be hung up as in the bleach house. Great care must be used in introducing the steam. If direct live steam comes in contact with the goods, it is liable to spot them, and in the case of some colors to injure the shade.

Fine spray nozzles should be used on the steam pipes, so that the steam may be diffused uniformly through the box or room. The roof of the steam house should have a steep pitch, so that the steam as it condenses will not fall in large drops on the goods, but will trickle down the roof to the sides of the building.

These observations on steaming knit goods are based upon experience covering sixty years, and they are submitted to the trade with every confidence that a more extensive adoption of the steaming process in finishing will be accompanied by a great improvement in the appearance and wearing qualities of the goods.

OLD SUPERINTENDENT.

—A recent U. S. Government report states that in consequence of the great demand for American cotton goods, the United States consumed more raw cotton than any other country in the world, leading Great Britain, which for a century and more has held supremacy in this industry, by over half a million bales, although the spinning capacity of Great Britain still far exceeds that of the United States or any other country.

Knitted Fabric.

The illustrations show a fabric recently patented in this country, and having some of the characteristics of both woven and knitted textures.

Fig. 1 shows the general appearance of the goods, while Fig. 2 is a diagram showing how the various threads are interlaced.

The designer states that the fabric is composed of one series of warp-threads a and another of weft-threads b, combined with a knitted web formed from a knitted thread f and comprising interlocking loops or stitches f′ and the part of the thread f lying between said loops f′ and designated by f^2. This fabric is made upon a spring-beard knitting-machine, its production upon the latch-needle machines being practically impossible.

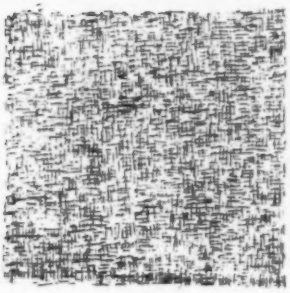


FIG. 1

FIG. 2.

The knitted web is formed in the usual way, comprising the interlocking loops f′. The warp-threads a are arranged between these loops or stitches, as shown, and in front of the portion f^2 of the knitted thread between the loops.

The weft-threads b are arranged in front of the warp-threads a, behind the knitted loops f, within a pocket between the warp-threads and the said loops, resting on the part f^2 of the knitted thread that extends back of the warp-thread.

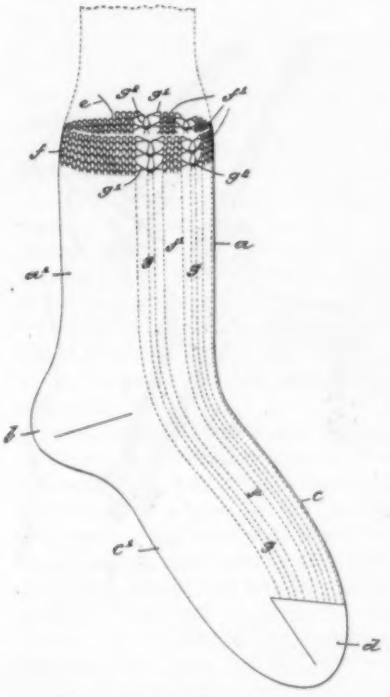
For the purpose of illustration and as shown in the drawings the weft thread or threads may be said to be arranged on top of the part f^2 of the knitted thread. It will be seen that since the warp-threads are introduced into the fabric without being strained or hard-twisted, as is the case with the loom fabric, the cloth has a much softer feeling; moreover, by reason of the arrangement of the warp and weft threads with each other and with the knitted web, the fabric may have any desired degree of firmness. After the fabric has been knitted as above described it is fulled and finished by the usual processes, with or without a nap, as desired.

The fabric is distinguished from ordinary knitted fabrics in that the threads are closely arranged, so that, as in the case of woven goods, the fabric may be fulled to form a substantially unyielding body and finished to give thereto the desired surface.

Woven goods have not the structural characteristics of this fabric, while the ordinary knitted webs or fabrics are elastic and have no structural features to enable said webs or fabrics to be either fulled, or finished, or formed into the article described and claimed.

Lace Effects in Seamless Hosiery.

The illustration shows a method of producing lace effects with circular knitting machine. The inventor says that in the automatic knitting of stockings the stocking, if formed on a dial-needle or ribbing machine, has had only the leg portion knit and ornamented with lace or open work on that machine. The leg has then been transferred to another machine, which knits the plain foot portion without lace effect.



Again, if the stocking is formed upon a straight-knitting machine the blank has been knit with lace or open work effect flat, somewhat in the manner in which fabrics are woven in a loom, and the flat blank has been thereafter suitably sewed into a stocking which has a seam at its back.

By this new method a seamless stocking formed of a single thread and having the toe, foot, heel, and leg portions knit continuously at one operation, is ornamented with a section or sections of open or lace work extending continuously along the front of the leg and over the instep of the stocking.

Circular knitting machines of various types may be altered to readily produce these effects.

Referring to the illustration a represents the leg, b the heel, c the foot, and d the toe portion, of the stocking, all of which are automatically knit by a single thread e continuously and in one operation. The rear or back portion a′ of the leg a, the entire heel portion b, the back or sole portion c′ of the foot c, and the entire toe portion d of the stocking are all formed of a plain regularly-knitted fabric f.

The front portion of the stocking extending along the leg and instep, is formed of sections f′ of regularly-knitted fabric united by a section or sections g of open or lace work fabric.

The precise arrangement of the courses forming the sections f′ and g is as follows: Beginning at the top of the stocking, the thread e is first knit or formed into a series of regular loops f′. The thread then crosses in a crossing thread or loop g′ a space of from three to five loops, when it is again formed into a series of regular loops f′, and again into a crossing thread or loop g′, and continues until the courses of regular and crossing threads or loops are completed.

For the next course the regular loops are knit; but instead of crossing threads a series of long loose loops g^3 are formed, above which the crossing loops or threads g′ are held. The open-work stitch therefore comprises a crossing thread or loop g′, locked to an elongated loose loop g^3, and is of a depth corresponding to a double course of loops.

The entire stocking is thus formed of a plain seamless knitted tubular fabric in which the leg and foot portions are formed of alternate sections of open or lace work united to sections of ordinary loops, the rows of ordinary loops in one section being

joined to the rows of ordinary loops in the adjoining section by alternate crossing threads and elongated loops, forming an open or lace work stitch or sections.

The regular or ordinary loops are also arranged continuously along the rear of the leg, the entire heel and toe, and along the sole portion of the stocking, while the alternate sections of regular and open-work meshes are arranged continuously along the front of the leg and the instep portion of the stocking.

on the pattern-wheel are set to change the yarn, when the cam 6 engages the truck 9, the lever 10 will be moved sufficiently to release the sliding rod 14 and throw the yarn-finger 16 to a position similar to that occupied by the yarn-finger 17.

This will result in bringing the yarn 2 between the needles and on the top of the arm f of the yarn-guide, and this yarn 2 will be carried along by the needles to the stitch-wheel, and knitted conjointly with the yarn 1, forming the splice.

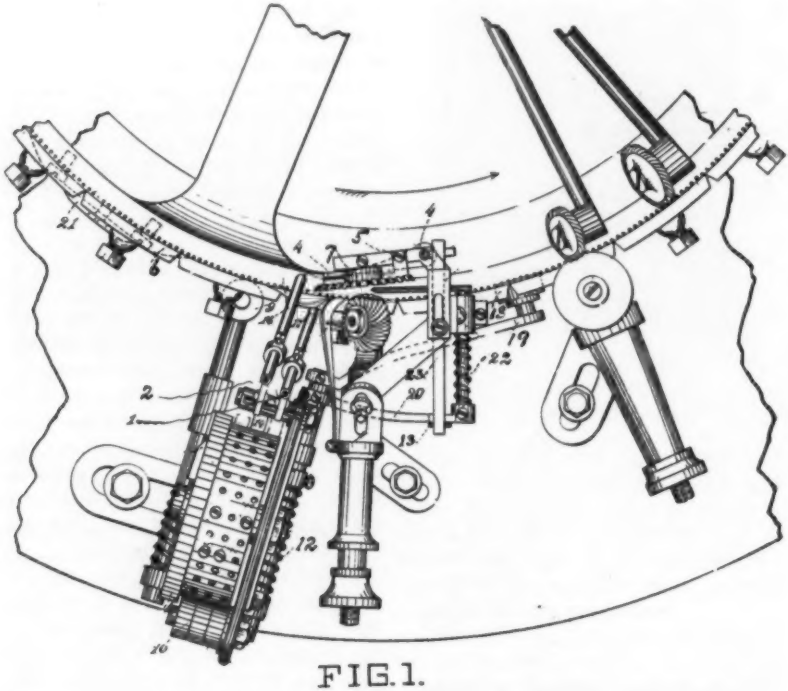


FIG. 1.

Striping Attachment for Knitting Machines.

The illustration shows a device for producing striped effects on cylinder knitting machines. The inventor describes the operation of the machine with but two different colored yarns, as follows: The yarn 1 is being knitted, while yarn 2, which runs through the yarn-finger 16, is held in the yarn-holder 4, 5. Assuming that the pins

This joint knitting will be accomplished by but three or four needles. Cam 6 will now engage the truck 9 and further rotate the cam-wheel, which will result in lifting the yarn-finger 17 to throw the yarn 1 out of action and inside the cylinder; the guide-wheel 7 will then engage this yarn 1 and by its rotation will guide it into the holder and between the blades of the shears.

It must be here stated that the

movement of the pattern-wheel, which results in throwing down the yarn-finger 16, does not move the lever 10 outwardly to its full extent; but when the surface engages the truck 9, the pattern-wheel by its further rotation moves the lever 10 out to its extreme limit, and this results in releasing the snap-catch 11, permitting the spring 12 to turn the shaft 8 and elevate the link 13, which elevation will open the shear and also the yarn-holder; these opening movements occur simultaneously with the lifting of the yarn-finger 17.

When the yarn-finger 16 is thrown down, the yarn 2 will also be brought into position to be engaged by the guide-wheel 7, and this yarn will also be guided by the wheel between the blades of the shear, the several parts being so arranged that this yarn will reach the shears just as they are opened. The yarn 2 will therefore enter between the blades of the shear in advance of the yarn 1, and yarn 2, which by this time will have been released from the holder 4, 5, will pass up the blades of the shear into the recesses 15.

The continued revolution of the cylinder will now bring the cam 21 into position to act on the truck 18, which will result in depressing the arm 19 and rotating the shaft 8 to bring the snap-catch 11 back into locking position. The arm 20 will likewise be depressed, which will result in pulling on the link 13, and thereby rotating the shaft 22 to close the blades of the shear and sever the yarn 1, while the yarn 2, by reason of its lying in the recesses 15, will not be cut. Simultaneously with the cutting action the outer end of the lever 23 will be free to drop and the spring 24 free to exert its power to move the plate 4 toward the plate 5, and thereby close the yarn-holder and clamp the thread 1.

As the cylinder continues its movement the loose end of the yarn 2 will be drawn out from the recesses 15 in the shear.

In order to prevent the yarn between the plates 4 and 5 from winding around the hub of the guide-wheel 7 is provided, a pin 33 which projects from the plate 5 through an opening or slot in the plate 44.

Hosiery Sizes.

Editor Textile World:

Relative to the matter of hosiery sizes to which considerable attention was given in recent issues of The Textile World, it may be of interest to hosiery manufacturers to learn of a very interesting and practical method of indicating sizes which was recently brought to the attention of the writer.

A prominent manufacturer of infants' silk heel and toe cashmere hose has adopted the plan of indicating the sizes by "welts" on the top of the leg of the stocking; for instance, as these goods are usually made in sizes 4, 4½, 5, 5½, 6 and 6½, size 4 would have only one welt, size 4½, two welts, size 5 three welts, etc. This system renders it unnecessary for the manufacturer to go to the trouble and expense of stamping sizes on the goods, and also prevents the practice of marking up of sizes by dealers, a brief reference to which was made in the April issue of this magazine. This would seem to be a very sensible, practical and economical plan and we see no reason why it could not be adapted to all lines of ribbed hosiery. CLAN.

—Combination in the textile trades has advanced much farther in England than in this country. According to a list recently compiled by a London newspaper, combines in various branches of textile manufacturing have been formed, which include 392 original establishments with an aggregate capital of nearly $300,000,000. These figures of consolidation are all the more impressive, as it is generally understood that our English cousins are not near as expert in the art of watering stock as are organizers on this side of the Atlantic.

SILK DEPARTMENT.

The TEXTILE WORLD asks practical men to contribute articles for this department. We pay for articles accepted. The acceptance depends entirely upon the value of the ideas expressed. We make all necessary revisions, and urge practical men to contribute, regardless of experience in writing for publication. Illustrations add much to the value of an article, and photographs and sketches are desirable. All communications are confidential, and under no consideration is writer's name published or made known without his permission.

Artificial Silk for Silk Fabrics.

LUDWIG BRAUN.

Some years ago first appeared in the technical press a communication regarding the use of artificial silk for silk fabrics. It was claimed for this product that it would soon replace natural silk to a considerable extent, and that the consumption of the latter would be proportionally diminished. These fears have, however, not been justified; on the other hand, the amount of natural silk in use has in the last few years appreciably increased. Nevertheless it would be foolish to deny that this artificial silk has some value in the manufacture of silk fabrics. Our purpose in the following lines is to discover how far this product is capable of being used for the manufacture of silk goods.

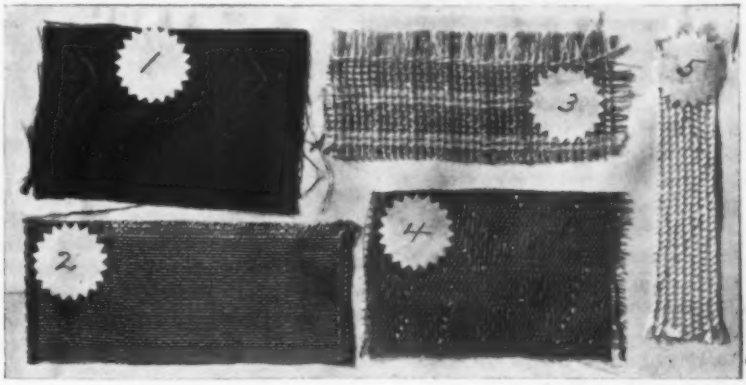
We distinguish at present two principal methods for the manufacture of this "Kunstseide": that of Chardonnet and that of Lehner. The former enjoys, however, the general preference; more or less successful attempts have been made to increase the perfection and flexibility of the material by admixture of gutta percha, etc. In France this improved Chardonnet process is in practical use, and by improvements in their method of production, the French have succeeded in advancing the manufacture a step higher; they have reduced combustibility of the artificial fibre, by treating the material in baths of ammonium sulphide and ferrous chloride, and have done their utmost to increase the smoothness and brilliancy of the product by a conformable modification of the spinning apparatus.

The Lehner method is really an adaptation of the original Chardonnet process, but as far as quality is concerned it surpasses the latter. As a matter of fact the Lehner method bestows on the product a brilliancy and lustre greater than that of silk itself. Also the Lehner goods are distinguished by a thorough softness and pliability, which make possible an easy working for many purposes. The thread clings with wonderful facility to the form of embroideries, which is not the case with natural silk; the Lehner production is also adapted for the manufacture of ribbons and lace, cords, fringes and tassels.

The straw hat factories in Europe use artificial silk for the manufacture of those narrow ribbons from which the so-called silk bast hats are prepared; and it has proved excellent material for the manufacture of ties and scarfs. Lately, too, artificial silk has been largely employed in jacquard weaving, and the attempts which have been made in this direction give favorable results.

There are, however, several obstacles to the introduction of artificial silk in any great degree for the manufacture of silk fabrics. Owing to its slight consistency and its great thickness, artificial silk only occurs in coarse numbers; the threads consist of 6/20 single threads and weigh 75/200 Den. This is the principal reason why artificial silk cannot be employed for warp. Another reason is its lack of elasticity; the warp threads can only bear a very slight tension. Fabrics

produced entirely from artificial silk have not recommended themselves, because of their indurability and lack of solidity in a damp condition. Artificial silk has, however, acquired an extensive adaptability for the weft in spun silk and cotton fabrics. Everywhere, where brilliancy and an attractive appearance are of greater consequence than durability and strength,



artificial silk has a safe position in the market. Attempts to make plushes from artificial silk have not shown good results. It is also used in the incandescent lamps.

Its further exploitation is retarded by the high price; even today a pound, raw, costs $2.00, and dyed $2.25. It goes without saying that we require for a fabric too large a quantity, because it cannot be obtained in so fine numbers. We will explain this by an example: We have, for instance, to manufacture a silk fabric with 250 warp threads per inch and in a size of 18 Den. Jurin. If we should take artificial silk for this quality, we should employ only 63 warp threads per inch because we cannot have the artificial silk under 75 Den. Moreover, the quality of the artificial silk is far different from that of the natural silk. A fabric with only 63 warp threads per inch would give a very imperfect covering. The dyeing of artificial silk has lately undergone important improvements. Today the principal difficulties in the dyeing have been surmounted; in consequence, all shades from the most delicate and lightest to the darkest, are turned out. The blacks are weighted up to 20 per cent.; the other colors are not weighted.

Artificial silk was first exhibited at the Paris Exhibition of 1889, in a very imperfect quality, however. French and Belgian firms had invested much money in this article, and lost heavily until improvements were introduced. Now, at any rate, the article has reached a state which renders possible an extension into all branches of the textile industry.

The further extension is hindered by the fact that many manufacturers have not forgotten the unsuccessful experience they had with the old unimproved qualities. If they would only decide to give it a new trial, its success would be assured. Until two years ago it was impossible to employ artificial silk for embroidering machines; but now alterations in the machines have made it perfectly simple.

The unsatisfactory experience with the first products from artificial silk, have rendered the trade somewhat suspicious of the goods. Nevertheless, the improvements made in its manufacture have made it possible to produce an article of high quality, and free from the faults of the early goods. Probably the best equipped factory for its production is that of the Vereinigte Kunst-Seidefabrick, Frankfort, Germany.

During the composition of this article, there were laid before the writer

patterns of artificial silk in a size of 30 Den., from the above mentioned manufactory. Hitherto the finest number manufactured had been 75. This small size contains 260,000 inches per kilo. It goes without saying that this constitutes a great step in advance. Moreover, the price of the fine size is only 25 cents per lb. higher than the coarser quality. No. 1 represents a tie material, the ground-picks of which are of black, and the effect-picks of red artificial silk. No. 2 is an all-silk ribbon with fast edges; the weft of this is artificial silk, the warp of real silk. This fabric contains only 50 picks per inch; that is a very low number, and it is therefore easy to judge of the evenness of the material. It is all that we can require. The handling of the fabric is certainly somewhat harder than natural silk, but far from unpleasant. The above mentioned ribbon was shot in 50 Den., 2-fold, with 50 picks per inch, and gives a sufficiently solid surface.

At present, the loss of time in winding and spooling the artificial silk is somewhat more than with the natural silk, and we reckon the loss at 10-12 per cent. When, however, one employs Canton tram in the real silk, the loss to be calculated is at least 10 per cent.

In the accompanying illustration No. 3 is a gauze fabric with cotton warp; the ground work of the filling is artificial silk. No. 4 is a cotton warp dress fabric with filling of cotton and artificial silk. No. 5 shows a sample of artificial silk braid

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—A French process for bleaching cotton, lately brought out, consists in treating the material with carbonic acid gas either before or during the immersion in the lime solution. A weak solution of hypochloric acid and carbonate of lime is formed, and by a longer handling this is converted into a clear solution of hypochloric acid and bi-carbonate of lime. If desired, a concentrated chloride of lime solution can be treated in this way, and afterwards diluted for use. This preparation is said to bleach thoroughly without injury to the fibre.

Syrian Silk for the United States.

The U. S. Consul at Beirut has been investigating the subject of direct shipments of silk from that region to the United States, instead of via Lyons as at present. He states that silk is to Syria what wheat is to our Northwestern States, and what cotton is to the South, and continues as follows:—

"The objections of the American manufacturer to direct silk transactions with Syria may be summed up as follows:

"The Syrian reeling does not conform at present to the American looms, the Syrian wheels being 80 centimeters (31½ inches) in circumference, while 64 centimeters (25.2 inches) would more nearly satisfy American needs. It is furthermore argued that the Syrian silk is not always clean, nor the threads perfectly even, and yellow silk does not answer as well for delicate shading as white. Besides, can the Syrian exporter be depended upon to live up to contracts?

"From correspondence with silk houses at home, I feel satisfied that these obstacles are not insurmountable, and I trust this will soon be conclusively proven. A silk-factory proprietor in the Lebanon has finally been induced to adopt 64-centimeter wheels, and a sample bale of 100 kilograms (220.46 pounds) is due to proceed to New York about April 1, consigned to a prominent commission agent in that city by H. Sabbag & fils, of Beirut.

"The Syrian silk thread is exceptionally strong, this being due to the excellent quality of the Syrian mulberry leaf on which the worm feeds. It is of the same color as the Italian silk, of which increasing quantities are being sold in the United States without Lyonese inspection. It is handled by persons who for years have been dealing on a large scale with the United States in wool, licorice root, bitumen, etc., and have never failed to make good their agreements. The scheme should be given

a fair trial. If success attends this experiment, the French wheels will probably disappear from Syrian silk factories.

"The average value of the annual raw silk exports from Syria may be put at $5,000,000. The United States bought raw silk in 1900 for $45,329,760, as against $32,479,620 in 1899 and some $5,000,000 per annum in the seventies. The total silk production of the world for 1900 being figured at 38,328,828 pounds, it would appear that the United States silk mills at the beginning of the twentieth century consume more than one-fifth of the entire output of raw material."

Silk Lustre on Animal and Vegetable Fibres.

We have learned that cotton and woolen goods are now being manufactured in Europe, that, by a process which is more or less secret, are given a silk-like lustre. Some of these goods have been imported into the United States. It is said that this process is not obtained by mercerizing, as it is used for woolen and worsted goods.

In a German work by Carl Suvern recently published, the various patents for giving a silk lustre to fibres are mentioned. A French process consists, in employing pure nitro-cellulose and sulphuric acid. The fibres are passed through this mixture, and afterwards through a mixture of silk and acetic acid at a temperature of 190° C. The inventor of this process afterwards secured a second patent, in which a mixture of silk in oxalic acid, ammonia, and soda or potash was employed for coating the fibre.

The Hosemann process consists in treating the fibre in an alkaline solution of silk, and then subjecting the goods to a sulphuric acid bath. By the Aubert method vegetable fibres are given the appearance of silk by treating them first in a sugar solution, then nitrating and afterward treating with tannic acid, and a double tartarate of antimony. By the Brodback patent, the cotton is hydrated with dilute acid or alkali solutions, and afterwards alternately treated with a concentrated solution of silk in alkali or in copper oxide of ammonia and with a mixture of silk and muriatic, phosphoric or sulphuric acid. The surplus silk is then removed by rinsing in acidified water, and the lustre is given to the cloth by friction.

By the Jenny process a mixture of equal parts of nitro-cellulose and alcohol is employed, which are combined in a solution of caustic alkali. The goods are impregnated with this mixture, and afterwards passed through a diluted solution of sulphuric acid to fasten the material on the fibre.

The Ungnad process consists in dissolving silk in alkali. The vegetable fibre is then immersed in this solution, and afterwards treated in a bath of double carbonated alkali, or subjected to the action of carbonic acid gas.

The Woltereck process consists in treating the cotton or other fibre in a mixture of cellulose and copper oxide of ammonia, nitro-cellulose, or in the cellulose carbonate prepared according to the Cross and Bevan processes. By means of dilute solutions of acid or of metallic salts the cellulose is deposited on the fibre in a thin layer, which gives the fibre the appearance, and in some respects, the properties of a natural silk.

Weighting Silk.

By the weighting of silk is understood the addition of tannate of iron, tannate and phrophate of tin; the use of sugar hardly comes within the category. The object of weighting is not only to make the silk heavier and to improve its appearance, but to thicken the fibre and hence to enable a larger mass of fabric to be made with the same weight of silk.

While, for example, one kg. of unweighted silk may make ten yards of fabric, it will make twelve when plus the additional matter, and fewer threads to the square inch are re-

quired. The weight of the fabric per yard may, however, be the same, and the feel and appearance quite satisfactory to customers.

When the so-called phosphate-silicate weighting, consisting of the phosphates of tin and soda and waterglass, was introduced, it gave such good results, as regards lustre and appearance generally, that many wholesale houses demanded silk containing it, to the exclusion of other sorts. Even the rapid wearing out of such silks and the consequent complaints did not check its consumption, and many dealers demand it to this day. The same practice has firmly established itself in black silk dyeing.

That it comes dearer to dye weighted than unweighted silk is only natural, but that is more than made up for by less silk being used. If a merchant were to attempt to supply in unweighted silk what he now supplies in the weighted fabric, he would have to raise his prices, and would be driven from business by underselling. Nevertheless, articles are made of unweighted silk for rich customers who are willing to pay for them. They, of course, get more wear for their money.

In many cases, however, fashion's changes make it unnecessary that the silk should be very durable. Ball dresses and elegant costumes have to last one year only or two at the most, and are not often worn at that, and many light colored articles are not worn again once they are dirty.

Many mistakes are made through not reckoning with the durability required in a silk to be used for any given purpose. For example, silk to be used for lining of a coat must either wear as long as the coat, or must be so cheap that the difference in cost between it and a better lining will cover the price of its renewal. For umbrellas, silk of great durability is required.

Dyeing a weighted silk often improves its durability, as the following table will show:—

	Average of 10 Results.	
	Elasticity.	Strength.
A silk simply scoured.....	173	71
The same weighted 30-40% and dyed in colors.....	191	80
The same weighted the same but by a different process.....	208	83
The same weighted about 45% and dyed black.....	171	92
Another silk scoured only..	84	69
The same weighted 30 40%...	72	96

Often, however, the result is the other way about, especially with extra heavy weighting.

That weighted silk rustles more and wears faster by rubbing fold against fold will be obvious, when we consider the hard nature of the weighting materials, which act like the teeth of a rasp. It also stands damp and light less well than unweighted silk.

It must be admitted, says the Dyer and Calico Printer, that, in the present state of affairs, weighting is unavoidable, but there is reason to believe that it is practised to an unnecessary extent. Heavy weighting, with tin-compounds especially, should be avoided whenever possible, and it is not unlikely that all hands would benefit by any combination of causes which might cause the abandonment of weighting altogether.

—A silk lustre, says the Leipziger Farber Zeitung, can be imparted to wool by careful treatment in free chlorine. Care must be taken not to have the wool too dry. The wool is then washed with soap, which develops the lustre.

—One of the strongest proofs of the injustice of man is the necessity for laws to compel him to be just.—d'Houdetot.

—Education should rest on two bases: the moral, to reinforce virtue; wisdom, to guard us against the vices of others.—Chamfort.

—That which proves man to be descended from the monkey, is that when he believes himself lost, he clutches at every branch.—Preault.

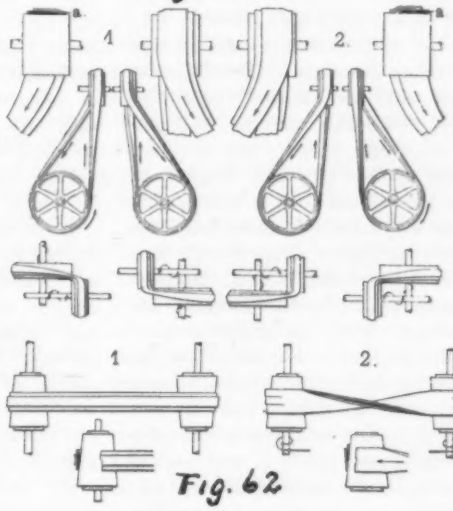
POWER DEPARTMENT

The TEXTILE WORLD asks practical men to contribute articles for this department. We pay for articles accepted. The acceptance depends entirely upon the value of the ideas expressed. We make all necessary revisions, and urge practical men to contribute, regardless of experience in writing for publication. Illustrations add much to the value of an article, and photographs and sketches are desirable. All communications are confidential, and under no consideration is writer's name published or made known without his permission.

Power Transmission.

In the previous articles on this subject the problems arising in power transmission when the two shafts are parallel have been considered. We will now illustrate some of the methods of transmitting power when the shafts cross or intercept at acute angles.

Fig. 61



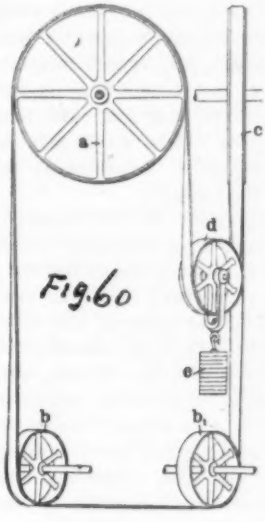


Fig. 60

Fig. 62

Fig. 63

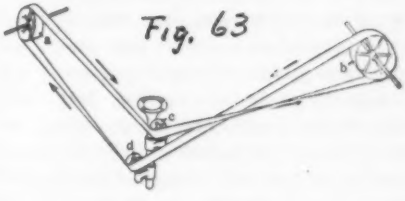


Fig. 64

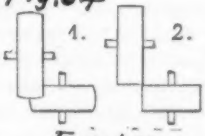


Fig 64

If the shafts are at right angles to each other, the power can be transmitted either by the left hand cross (shown at figure 61), or the right hand cross (shown at figure 61-2). The relative position of the two pulleys is also a factor in these problems. Many claim that the position (shown at 64-1) should be employed, while experiments by Bach, indicate that this position of the pulleys is not right, and that the position (shown at 64-2) is preferable.

Exact directions as to the adjustment of the pulleys cannot be given, because there are so many different factors entering into consideration, such as the speed, tension, width, length, and weight and condition of the belt, as well as the size of the pulleys; it is therefore necessary to experiment in each case and adjust the pulleys so as to conform to the tend-

ency of the belt. For transmitting power in such cases the pulley should be about one-third wider than when the shafts are parallel, as the belt will vibrate more on the face of the pulley. The face of both pulleys should be straight. A Hamburg engineer recommends for half cross belts the stair form of pulley (shown at 61-1); by this arrangement the extreme tension on the belt between the edge of the pulley and the point a is avoided, the wear sideways on the belt prevented, and the formation of the necessary dute by the removal of the pulley facilitated.

If the two shafts are placed at any other than a right angle to each other, it is necessary to use carrier pulleys, which should be constructed so that they can be adjusted either up and down or at an angle. These carrier pulleys can be divided into two classes, the ceiling and the wall pulleys, according as they are fastened on the ceiling or wall. Figure 63 shows the employment of carrier pulleys by which the belt is carried from A over the pulley C to B and then back over the pulley D to A, and is at the same time crossed, changing the direction in which the shafts revolve.

Figure 60 shows the use of carrier pulleys in connection with a tension pulley; a is the driver, and the belt passes from a, over the tension pulley d, to the driven pulley c, and then is carried over the carrier pulleys b and b1 back to the driver a. These illustrations show how belts can often be used in place of gears. They are to be preferred to gears for many reasons; the noise of gears is avoided, less power is consumed, and finally the construction is much simpler since the use of carrier pulleys permits of economy of room by having the shafts at a greater distance from each other, and at any desired angle.

Finally we would mention the use of cone pulleys, by which the speed of the driven pulley can be varied without altering the speed of the driver. Figure 62 1 and 2 shows examples in the use of these pulleys. No. 1 shows a straight belt, and No. 2 a cross belt. Cone pulleys require a certain belt speed which depends upon the slope of the cone; this slope should be as small as possible in order to prevent damage to the belt, and the distance between the shafts should not be less than four times the average diameter of the pulley and 20 times the width of the pulley. A cross belt on cone pulleys is preferable to the open belt, particularly for a speed under 22 feet a second.—Technische Rundschau.

Purification of Water.

It is said that the water used for industrial purposes in Vienna, Austria, is as impure as can be found anywhere. Analysis of the Vienna water shows a large amount of lime carbonate and sulphate, and sulphate of magnesia. If condensed water and soap are mixed together and then poured into the Vienna water, a thick, cheesy substance is deposited at the bottom of the vessel.

A correspondent of the Deutsche Farber Zeitung says that if the water at Vienna is used in steam boilers a deposit of more than ⅜ of an inch soon forms on the inside of the boiler plates. The writer is proprietor of cotton print works at Vienna, and was forced to adopt some means of purifying, at a low cost, the 12,000 gallons of water which he used daily.

He had two iron reservoirs constructed, each with a capacity of 2000 gallons. He made numerous experiments on a small scale with the river water, and finally adopted the following method: Both of the reservoirs were placed above the steam boilers, and each was filled three times per day with the river water. The water was purified in one, while it was being used for feed water from the other. The 2000 gallons of river water was heated to 50° C. by means of closed steam pipes; 6 lbs. of quicklime was dissolved in 10 gallons of water, and added to the water in the reservoir; after stirring well for a quarter

of an hour, 11 lbs. soda crystals dissolved in 10 gallons of water was carefully added and again the mixture was stirred for fifteen minutes. The water was then allowed to settle for three hours, at the end of which time the carbonate of lime and magnesia were well precipitated so that the purified water could be used in the boilers.

The water which had been standing in the reservoir over night was tested every morning for lime and magnesia, in order to determine the proper proportion of purifying materials to be used for that day. It was found that these proportions varied with the time of season and meteorological conditions. After using this water for two months in the boilers, a very thin incrustation was found on the plates, not much thicker than a piece of paper.

If this method is to be used for dyeing, it should be borne in mind, that a small quantity of soda is left in the purified water. For many colors this alkaline reaction is not objectionable. But if the dye bath must be neutral the necessary quantity of acid should be added to the water.

As water varies very much in different localities, it is necessary to have a careful analysis made of the river water before using this method of purification, as the proportions given are suitable only for the river water at Vienna. About six carboys should be filled with water and varying proportions of lime and soda should be added, and after letting the soda settle, tests should be made, and the proportions varied in later experiments, until the water is found to be free from lime and magnesia. In order to attain the best results, one should use such quantities of the materials as careful tests by an experienced chemist has indicated to be necessary.

—Dissimulation is silent falsehood.—Fallex.

Growth of the Draper Company's Plant.

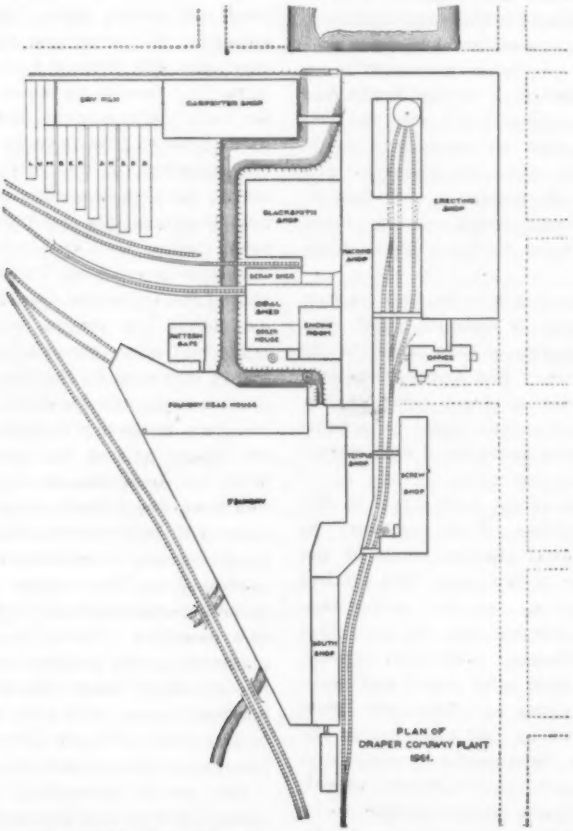
The Draper Company, of Hopedale, Mass., has recently completed many important changes in its works, and these, with other alterations now in progress, are illustrated by the plan presented.

The industries at Hopedale were built up under various corporations, each of them owning its own separate plant and power. Since 1896, the consolidation of the various former interests into the Draper Company has, naturally, tended to unite the plant as well. While many changes were made prior to 1900, in order to enlarge the capacity of the various departments, the idea of uniting all the various structures into one plant was not really begun until that time. During the past year, new building operations have connected the entire plant, as shown, the design being to not only centralize the various departments, but also to balance their productive capacity. In these changes, it has been necessary to entirely demolish nearly half of the former plant. With the completion of the present alterations, five former groups of buildings will have been entirely sacrificed. Among other changes, it was necessary to fill a large pond, and move various buildings from their former locations. While the completed plant can easily employ from four to five thousand hands, careful provision has been made, with a view to future enlargement without disturbing the location of the present departments.

The power, instead of being furnished by four separate plants, as formerly, is now obtained from one central department, with new equipment throughout. In addition to the ample railroad facilities, as shown, there is a system of basement tracks, running the entire length of the works, and connected with convenient elevators, to serve in distribution of the castings and finished parts.

The carpenter shop, dry kiln, and lumber sheds, are isolated from the main plant by a canal, for fire protection, and the pattern safe is also in a separate fire-proof building, for the same purpose.

The screw shop is only connected by bridges; but this is a department so entirely unlike the rest, in character, that this separation involves no inconvenience.



The size of the buildings in the plan is quite misleading, unless one appreciates the fact that the illustration shows them on the very minute scale of 315 feet to the inch. The erecting shop and foundry are easily the largest of their kind in New England. The machine shop is five stories in height, with basement; the erecting shop four stories. The Company owns a large amount of real estate not represented on the plan shown, consisting of hundreds of acres of land, with mill privileges, etc., and several hundred tenement houses.

As manufacturers of cotton machinery, the present Company has made certain records, by employing 2800 hands, which is believed to be the largest number working at one time for one company, in this line, and in shipping a total of nearly 15,000 looms, as a part of its general product, in one year, all previous records are exceeded by far.

The completed works will have a capacity of from 25,000 to 30,000 looms per year, and, as there are at least nearly 350,000 common looms which the Draper Company feels must be replaced, to say nothing of the probable increase in new mills, it is quite possible that this rate of production

may soon be attained. The other departments of manufacture have also been enlarged throughout, the last year noting high water mark for capacity in practically every separate department.

It must be understood that the Draper Company and its predecessors never intended to build a full line of cotton mill machinery, but simply to manufacture specialties controlled by patents, and embodying new ideas. In spite of this restriction, however, the line of trade has greatly broadened, so that this Company manufactures nearly every machine used in the ordinary cotton mill spinning room and weaving room, including everything for spinning but the frames themselves; Spoolers, Warpers, Twisters, Reels, Banding Machines, Drawing-In Machines, and Looms.

Heating and Ventilation.

The absolute necessity of thorough technical training as a foundation for the successful heating and ventilating engineer is clearly presented in a recent article by Prof. S. H. Woodbridge of the Massachusetts Institute of Technology who says: "As an applied science, ventilation involves the movement of air through supply and discharge conduits, and either such effective diffusion of air within enclosures as to furnish air to and remove impurities from all their parts, or else such concentration of air movement as shall prevent the diffusion of impurities locally produced, and as shall effect their removal without diffusion through the enclosures.

"So considered, ventilation is a department of mechanics and mechanical engineer, a distinctly technical field. Without technical training, the questions of simple mechanics which are involved in such problems become mysterious in theory and vagaries in practice, and results become a matter of chance rather than of precision. Ventilation deals with air, an invisible substance; with vitiation, and invisible impurity; with unseen motions; with motive forces often intangible; with courses of motion which are limited within invisible bounds. The field is a wide one for the play of fantasy in its mild and in its most erratic form. The capricious art can become an established science only in the hands of those who are too well grounded in the fundamental principles of ventilation involved to make it possible for them to entertain any theory, advance any explanation, or advocate any practice in matters of ventilation which is not clearly based on the demonstrable laws and well-known phenomena of the mechanics of gases, all of which demands a technical training of no mean order."

Use of Iron in Mill Construction.

II.

(Continued from March.)

Iron has been very little used in the window sashes, frames and openings, but as it has several advantages in these places its use is sure to increase for these purposes as time rolls round. In the old style narrow mills it was easy to get a good light across the room even with comparatively small windows; but with the great increase in the width of mills, rendered necessary for the economical setting of modern machinery, more especially mules, greater attention has to be paid to the best means of lighting, that the central portion will get the maximum amount of light possible.

Flat or straight-headed windows are superior to those finished with arched tops because with the flat topped window it is possible to bring the glass within a few inches of the ceiling across the entire width of the window opening, which is of course impossible in an arched opening.

In the wide window openings of modern mills the distance is too great to use a flat brick arch; but by using suitable cast iron window heads this trouble is overcome. These window

heads are from twelve to sixteen inches deep on the outside face and show flush with the brickwork. A cast iron window sill can also be used, of either an L or channel-iron section, showing from six to nine inches deep on the face. A window sill of this construction is cheap and, if properly set and protected, practically indestructible. In Europe they are using cast iron for frames and sashes with entirely satisfactory results. These sashes are practically all of the transom type, the upper portion of the sash being hinged and opening inwards at the top by any of the usual transom fittings.

The insurance companies now very often ask that cast iron sills be put under the fire doors in the mill, so that in case of fire the flames will not have a chance to work under the door and prevent its use.

The use of cast iron columns is far more general than that of iron beams; they are open to the same objections that the beams are in case of fire; and to make them reliable and more acceptable to the insurance authorities, it will be necessary to provide some efficient non-conducting covering. They are superior to wood in sightliness, and occupy less room.

MECHANIC.

Water Required to Make Steam at Any Pressure.

The weight of water required to make one cubic foot of steam at 60 lbs. pressure is .1425 lbs.; at 70 lbs. pressure is .1648 lbs.; at 80 lbs., .1869 lbs.; 90 lbs., .2089 lbs.; 100 lbs., .2307 lbs.; 110 lbs., .2521 lbs.; 120 lbs., .2738 lbs.; 130 lbs., .2955 lbs.

The weight of water is obtained by multiplying the number of cubic feet of steam required by the weight of one cubic foot.

Example:

How much water will it take to make 200 cubic feet of steam at 100 pounds absolute pressure?

One cubic foot of steam at 100 pounds pressure is given above as weighing 0.2307 pounds, therefore 200 cubic feet will weigh 200 × 0.2307, or 46.14 pounds of water.

One cubic foot of water may, for any practical purpose, be reckoned to weigh 62½ pounds and one gallon of water may be taken as 8 3/10 pounds. 46.17 pounds divided by 62.5 gives .74 cubic feet, or 46.17 pounds divided by 8.3 gives 5.56 gallons.

At atmospheric pressure one cubic foot of steam has nearly the weight of one cubic inch of water, and the weight increases very nearly as the pressure; for an approximate estimate if no steam tables are at hand, it is well to remember the rule:

Multiply the number of cubic feet of steam by the absolute pressure in atmospheres, and the product is the number of cubic inches of water required to give the steam. In all such calculations for practical purposes, a liberal allowance must be made for loss and leakage.

--A simple apparatus for freeing feed water from oil is described in the German journal, Kraft. A holder or tub about four feet high is divided by two partitions into three compartments; the first one, about half of the tub, is filled to the top with coke; the other two of equal size, each occupying one-quarter of the whole space, are filled about one-quarter full of coke. The condensed water flows into the larger compartment, through the coke and into the other two divisions. Opposite the inlet, and about an inch from the bottom, a siphon-shaped pipe carries the water to another receptacle, from which it is pumped to the boilers. Any oil that may collect on the surface of the water in the two smaller compartments is skimmed off; the coke is changed from time to time, that which is soaked with oil being burned. The German journal states that this is a very serviceable apparatus for feed water purification.

DYEING DEPARTMENT

The following recipes appear in the Dyers' Supplement, which is issued each month by the TEXTILE WORLD. The Supplement contains the colored samples, dyed according to recipes given. The selection of samples is carefully made, and it is the aim to show shades which are of especial interest to the dyer, and which the requirements of the market demand. The Dyers' Supplement is a 16 page pamphlet, in convenient form for preservation. Subscription price for the TEXTILE WORLD with the Dyers' Supplement is $4.

The TEXTILE WORLD asks practical men to contribute articles for this department. We pay for articles accepted. The acceptance depends entirely upon the value of the ideas expressed. We make all necessary revisions, and urge practical men to contribute, regardless of experience in writing for publication. Illustrations add much to the value of an article, and photographs and sketches are desirable. All communications are confidential, and under no consideration is writer's name published or made known without his permission.

Dye Recipes for June.

Recipes Nos. 81 and 82.

Sample No. 81 and No. 82 were prepared as follows:

A dyeing was made of 5 per cent. of an ordinary Direct Black and 20 per cent. of Common Salt boiled an hour and well rinsed. The dyed yarn was divided into two lots, No. 81 was left as it was while No. 82 was treated for 30 minutes in a bath of water at 140° F. containing Diazol equal to 4 per cent. of weight of goods.

After drying both lots were plaited with white cotton yarn, and both were then scoured in a 5 per cent. solution of Soap at 160° F. for 30 minutes. As will be seen, the Black in No. 81 not being treated bleeds and stains badly. While the same Black in No. 82 scarcely bleeds at all. Thus confirming the value of Diazol for the purpose claimed.

Recipe No. 83.

Brown on Cotton Yarn.

Benzo Brown D 3 G on 100 lbs.+ of cotton yarn.

Prepare the dye-bath with

2 lbs. Benzo Brown D 3 G.

(Farbenfabriken of Elberfeld Co., 40 Stone St., New York.)

40 lbs. Glauber's Salt.

2 lbs. Soda Ash.

Enter the material at 180° F., bring to a boil and dye at that temperature for one hour.

Benzo Brown D 3 G deserves special interest on account of its low cost and high coloring power, producing a full shade of reddish brown with 2 per cent. of the dyestuff.

It possesses tolerably good fastness, is easily soluble and dyes level.

Recipe No. 84.

Blue on Worsted Yarn.

Compound shade on 100 lbs. of worsted yarn.

First mordant the yarn in a bath made up as follows:

3 lbs. Potassium Dichromate.

2 lbs. Tartar.

Enter the yarn at 140° F., bring to a boil and mordant at this temperature for one and one-half hours.

Then dye in a bath made up with

3 lbs. Anthracene Blue C. P.

½ lb. Anthracene Red B. N.

(C. Bischoff & Co., 87-89 Park Place, New York.)

2 to 3 lbs. Acetic Acid (added to exhaust the bath) entering the yarn at 130° F., bringing slowly to a boil and dyeing at this temperature for one hour, exhausting the dye bath if possible.

Recipe No. 85.

Red on Worsted Yarn.

Diamine Fast Red F on 100 lbs. of worsted yarn.

Prepare the dye bath with

3 lbs. Diamine Fast Red F.

(Wm. J. Matheson & Co., Ltd., 182 Front St., New York.)

3 lbs. Acetic Acid.

Enter the yarn at 140° F., bring to the boil and after boiling one-half hour add

3 lbs. more of Acetic Acid.

Boil fifteen minutes longer and then add

1½ lbs. Chromium Flouride.

Then continue the boiling fifteen minutes longer. Wash and dry.

Diamine Fast Red F is distinguished by its excellent fastness to light, and is particularly adapted to the dyeing of high grade carpets and rugs.

Recipe No. 86.

Blue on Mercerized Cotton Yarn.

Dingley Blue 2 R on mercerized cotton yarn.

Prepare the dye bath with

3 lbs. Dingley Blue 2 R.

(Schoellkopf, Hartford & Hanna Co., 100 William St., New York.)

20 lbs. Common Salt.

Enter yarn at 180° F., bring to a boil and dye at that temperature for one hour.

Dingley Blue 2 R produces full and even shades of blue and possesses all the characteristic properties of the direct cotton colors.

Recipe No. 87.

Black on Cotton Yarn.

St. Denis Autogene Black on 100 lbs. of cotton yarn

Prepare the bath with

200 lbs. of Common Salt.

2 lbs. Soda Ash.

20 to 25 lbs. St. Denis Autogene Black.

(Sykes & Street, 85 Water St., New York.)

Enter the goods at 130 to 150 degrees F., raise gradually to about 200° F., and turn regularly at that temperature for one hour. Lift, wash well, pass through soap or soluble oil bath, and finish.

For second and following batches add only sufficient salt to maintain the density of the original bath, and omit sal soda.

The quantity of Autogene Black required depends entirely upon the shade desired. If very full blacks are required, start with 25 lbs., use 18 in second bath and 15 in third and successive baths. For full good blacks use 22, 18 and 14 lbs. respectively. For medium blacks use 20, 16 and 12 lbs., etc.

Sal soda is mainly used to correct the hardness of the water.

Recipe No. 88.

Black on Mercerized Cotton Yarn.

Bengal Deep Black B. Extra on 100 lbs. of mercerized cotton yarn.

Prepare the dye bath with

6 lbs. Bengal Deep Black B Extra.

(Sykes & Street, 85 Water St., New York.)

30 lbs. Common Salt.

Enter yarn at 180° F., bring to a boil and dye at this temperature for one hour.

Bengal Deep Black B Extra besides being an excellent direct cotton color is also suitable for the dyeing of cotton and wool mixed goods and possesses the advantage of showing with common salt greater density of shade than with Glauber's salt.

Recipe No. 89.

Yellow on Worsted Yarn.

Meta Chrom Yellow R on 100 lbs. of worsted yarn.

Prepare the dye bath with

3 lbs. Meta Chrom Mordant,

3 lbs. Meta Chrom Yellow R

(Berlin Aniline Works, 72 Front St., New York.)

Enter the yarn at 100° F., raise to the boil during three quarters of an hour and then boil one hour longer, to completely fix the dye.

The point of interest of this color is that the mordanting and dyeing are carried out in one bath, thus producing dyeings fast to milling without the necessity of a previous mordanting or after treatment.

Recipe No. 90.

Black on Cotton Yarn.

Direct Black G on 100 lbs. of cotton yarn.

Prepare the dye bath with

7 lbs. Direct Black G.

(A. Klipstein & Co., 122 Pearl St., New York.)

30 lbs. Common Salt.

Enter the yarn at 170° F., bring to a boil and dye at this temperature for one hour.

Direct Black G possesses all the characteristics of the direct cotton colors and produces full and even shades of black.

Recipe No. 91.

Fast Pink on Mercerized Cotton Yarn.

Direct pink on 100 lbs. of mercerized cotton yarn.

Prepare the dye bath with

4 oz. Direct Pink.

(O. S. Janney & Co., 8-10 Letitia St., Philadelphia, Pa.)

35 lbs. Common Salt.

Enter the yarn at 160° F., and while turning raise to the boil and continue the boiling for one hour. Dry without washing.

Direct Pink gives very bright and clear shades even on unbleached yarn and as the bath is well exhausted washing after dyeing is unnecessary. The shade produced is extremely fast to light, washing, scouring, and will stand the laundry test of washing, starching, and ironing.

The color goes on the fibre slowly and consequently even shades are produced.

Recipe No. 92.

Green on Mercerized Cotton Yarn.

Oregon Green B C on 100 lbs. of mercerized cotton yarn.

Prepare the dye bath with

3 lbs. Oregon Green B C.

W. A. Ross & Brother, 11 William St., New York.

25 lbs. Common Salt

Enter yarn at 170° F., bring to a boil and dye at this temperature for one hour.

Oregon Green B C possesses all the characteristics of the direct cotton colors, and is also suitable for the dyeing of cotton and wool mixed goods.

Recipe No. 93.

Yellow on Worsted Yarn.

Flavozine L on 100 lbs. of worsted yarn.

Prepare the dye bath with

2 lbs. Flavozine L.

(Victor Koechl & Co., 122 Hudson St., New York.)

10 lbs. Glauber's Salt.

4 lbs. Sulphuric Acid.

Enter the yarn at 170° F., bring to a boil and dye at this temperature one hour, exhausting the bath if possible.

Flavozine L possesses the following properties of fastness. Fastness to light far exceeds that of most acid dye stuffs. It withstands the action of all kinds of alkalies, and is also fast to acids in carbonizing and to pressing, drying, ironing and steaming.

Recipe No. 94.

Black on Cotton Yarn.

Tetrazode Black B on 100 lbs. of cotton yarn.

Prepare the dye bath with

5 lbs. Tetrazode Black B.

(New York & Boston Dyewood Co., 55 Beekman St., New York.)

30 lbs. Common Salt.

2 lbs. Soda Crystals.

Enter yarn at 170° F., bring to a boil and dye at that temperature for one hour.

Tetrazode Black B is a direct black of high coloring power and low cost and produces a Blue Black of which the fastness is very good.

Recipe No. 95.

Light Blue on Worsted Yarn.

Kitone Blue on 100 lbs. of worsted yarn.

Prepare the dye bath with

1 lb. Kitone Blue.

(A. Klipstein & Co., 122 Pearl St., New York.)

15 lbs. Glauber's Salt.

3 lbs. Sulphuric Acid (added gradually).

Enter yarn at 170° F., bring to a boil, and dye to shade.

Kitone Blue produces shades which are absolutely fast to alkalies, and stand washing, and stoving very well. It goes on evenly, and is well adapted to use in the production of compound shades.

Recipe No. 96.

Brown on Mercerized Cotton Yarn.

Chlorazol Brown B on 100 lbs. of mercerized cotton yarn.

Prepare the dye bath with

3 lbs. Chlorazol Brown B.

(Read, Holliday & Sons, Ltd., 7 Platt St., New York.)

30 lbs. Common Salt.

Enter the material at 180° F., bring to a boil, and dye at this temperature one hour.

Chlorazol Brown B possesses all the characteristic properties of the direct cotton colors and produces full and pleasing shades.

Shaded Piece Dyed Knit Goods.

I have repeatedly observed goods knit so tightly as almost to be devoid of elasticity, not alone at the heel and toe sections, but even along the legs all the way or in bars at distances apart. Such goods when colored would be shaded while still in the dyer's hands. No ordinary cleansing process would take the dirt out where so firmly held packed in among the fibres, and material to be properly colored must first be bereft of grease and gum and foreign substances. There is no remedy for these greyish partially dyed places. The goods must be redyed some dark shade. The hosiery already en route must all be inspected and the damaged portions separated from the rest, if possible.

Spots of all sizes result from oil droppings at the knitting and seaming tables. When with the oil is mingled metallic dust worn from bearings, a formidable compound is deposited upon the fabric, which is anything but easy to remove, particularly when the goods have been in stock for some time previous to being sent to the dyehouse. I have known of cases where a stocking would occasionally be made use of by some thoughtless knitter to wipe off his machine or oil can.

A line of knit goods I have in the past dyed largely was known about the mills as "tubeing." I refer to those lengths of seamless bag-like pieces made on large machines a foot or more in diameter, intended to be cut up and tailored into boy's sailor suits, topshirts, underwear, etc. While working with these long pieces I have experienced the same trouble on account of bad knitting, and droppings of oil. Indeed these are imperfections common to every class of knitted work, unless most carefully guarded against.

It is positively necessary for the dyer to protest against all these little things; and he must not be called "an everlasting kicker" when he does. In a well regulated mill the great bulk of his kicking should be forestalled. There should invariably be some system of examining and sorting out defective pieces of the kind I have noted, before sending out the work, in order that the dyer may have the spoiled ones by themselves to treat as they demand. Why not? Witness the systematic labor and care spent upon the "examining" of yarns in any large and successful worsted mill today. In the dyeroom there are not facilities for doing the job. Finally allow me to impress upon dyehouse hands the great desirability of clean floors; and upon the knitters the detrimental influence on clean, bright, even shades that the practice of tossing about hosiery, etc., on their floors very often has. Although they must ultimately be cleansed, they should not be besmeared in order to make work.

A noticeable and not unfrequent cause of unevenness is the use of dyes that are not suited to the work. Dyes that may be well adapted to the dyeing of loose stock, may on the other hand, when applied to the dyeing of pieces, prove failures so far as level colors are concerned. The property of dyeing evenly is essential for dyes used in piece coloring. I know of a hosiery manufacturer that tried to use a nice looking aniline marine blue on cashmere stockings. It would not dye the heels and toes like the rest of the hose, and portions of these were not fully penetrated. The body of the hose in some instances was spotted

also at intervals. I found that the blue dye was a mixture of violet, green and claret anilines possessing little affinity for each other, and consequently unable to work together. The dyer lost his situation over the miserable stuff. The number of such mixed dyes today is legion, and dyers need to be chary of them. If a mixed lot is suspected, it can sometimes be detected by dusting a very small quantity of it into a glass of clean water, and watching the ingredients dissolve as they descend; this, however, does not answer in all cases.

In colors that are first mordanted clouds and streaks occasionally develop. These are caused either by entering the pieces into a bath much too hot for safety, or else by bringing them too quickly to boiling point. To pitch a batch of loose stock into a boiling chrome bath, for example, is quite another matter from trying to start piece goods of any description after the same fashion. Begin moderately cool, and work a while to even up, before turning the steam on. Keep in motion while the temperature is rising, and the danger point is past. If the pieces at any time should seem to mordant unevenly, try to level them by prolonged gentle boiling and the addition of lactic acid or Glauber's salt, or both. Don't attempt to take them to the finishing bath while any uncertainty exists about the bottom. Many colors are nowadays mordanted on top of the dye. In such a case ascertain that the goods are fully levelled before adding the fixing chemicals, for afterwards will be too late.

I am reminded that clouds of a bronzy character are at times to be met with in navy blue or black dyed wholly or in part with logwood or its extracts. While the extract and handling are sometimes at fault, I have found that this mischief could be generally overcome by humoring the goods in the mordant bath. This is especially important when working pieces made of shoddy and similar material. It is very important to have the right sort of utensils to work with. A bad workman is said to always quarrel with his tools, but for all that it is not to be supposed that it pays to deprive any kind of a workman of whatever he ought to have for the prosecution of his labor. Certainly not.

As to washing machinery I have nothing to say against laundry washers or dolly machines, nevertheless, give me the good old fashioned "kicker stocks," having crank motion overhead, and an intelligent man accustomed to their use. A rinse box is a very useful adjunct. The stocks can be used to best advantage in washing hose, socks, overstockings, lumbermen's felted boots, and certain classes of underwear and sweaters. The proper way to wash tubeing is in a regular woolen mill washer such as is used for clothes; such goods cannot be scoured well in the stocks or by any other method. If the tubeing is to be fulled to such an extent that it cannot well be done in scouring alone, then put the goods first into the stocks, and felt them there most carefully in the grease for a short time. Finally take them out and run them with hot water in the cloth washer. It is likely no further addition of soap will be needed to cleanse them besides what is left in them from stock fulling, but if required do not scruple to add more. Then thoroughly rinse them in warm water. If scoured in the "kickers," they will be unevenly felted, and clean only in places.

The main points to be noted in regard to boiling out cotton work for dyeing are complete and continued saturation and thorough cleanliness in handling. The same remark applies to bleaching these goods for light shades. Quite a large trade is done in coloring cotton tubeing to be manufactured into underwear, jerseys and other articles of apparel. Care should always be exercised in seeing that all the rolls belonging to one batch of pieces are treated together in boiling out and bleaching, otherwise difference in shade may result. For the same reason let the different "strings"

or lengths of tubeing prepared for coloring be as nearly as practicable of the same length, so that every string may share alike in number of revolutions in all the baths and alternate air exposures.

For dyeing hosiery of all kinds the usual rotary machinery of various types may be used. The old fashioned open tubs give good results. They should not be too deep, otherwise blotches and clouds will appear. The tubs should flare out wider at the top than at the bottom. There is such an all around advantage in the wide mouth and narrowing body that it will repay to build them in this way. It is a good thing to finish off the top of the tub staves all around with a ⅝ inch light rounded brass circle, cast in segments, and firmly and smoothly fastened down. This adds much to the life and utility of the kettle, and occasionally saves goods from injury through being crushed under a pole on the irregular tub rim.

The dimensions of a small tub of this build to contain about one hundred pounds of hosiery would be as follows: Make it of sound two inches and half pine, spruce, or the like; four feet in diameter at the bottom, four and a half feet wide at the top; staves, four feet long over all, with four good rods or flat hoops, preferably with tension screws. Four or five inches above the bottom inside place a perforated copper false bottom, resting on two pieces of scantling each about two and a half feet long attached to the real bottom. Cut out these pieces on the under side at intervals to allow of free circulation of the steam and hot water when in use. Have the outer edge of the false bottom rest solidly upon a rim made of upright narrow blocks of inch lumber nailed around the tub inside.

LEVEL DYE.

—Happiness consists in doing well a work that is congenial.—Claretie.

—He who talks before reflecting resembles a hunter who fires before taking aim.—Montesquieu.

Diazol for Fastening Direct Blacks.

We present in our Color Supplement this month two practical tests showing the efficacy of Diazol manufactured by L. B. Fortner, 36 Strawberry St., Phila., for fixing the Direct Blacks against bleeding into the white, when washed and scoured together.

It is a well-known fact that while many direct dyeing blacks give good results as to color and fastness to light and washing, yet when washed or scoured with white cotton, they will bleed to a varying extent, thus smutting and discoloring the white. It has been found that if after dyeing in the usual way, the black yarn or goods be submitted to the action of Diazol in weak solution, the color is not only made fast to washing and bleeding, but is given greater intensity and brilliancy.

The process adds but little to the cost, and is applicable to raw stock, yarns, piece goods, etc. We understand that Mr. Fortner is supplying Diazol to many of the largest dyers in this country.

—Judged by German exports and imports of aniline and coal tar dyestuffs in 1900, this industry shows a marked growth as compared with the previous year. The imports of materials for these dyes in 1900 amounted to 2,348,200 lbs., valued at $930,000, an increase as compared with 1899 of about 15 per cent. The United States supplied 52 per cent. of this quantity, the other 48 per cent. being divided up among a number of other countries. The largest amount supplied by any one country was only 15 9/10 per cent., this coming from England. On the other hand, Germany exported in 1900 47,562,400 lbs. of aniline and coal tar dyestuffs, valued at $18,834,720; of this quantity England took 22 1/10 per cent., with the United States a close second, taking 21 6/10 per cent. The balance was distributed among a number of other countries, the largest quantity taken by any one being 9 3/10 per cent., which went to Austria.

Foreign Notes.

—The Lyons Silk Merchants' Association have published the following estimate of the raw silk production in 1899 and 1900 throughout the world:

	1899 lbs.	1900 lbs.
Europe	9,410,000	9,691,000
Asia Minor and Central Asia	3,925.000	3,861,000
Extreme Orient	25,505,000	22,827,000
	38,840,000	36,379,000

—It is a curious fact that tapestries, the most elaborate and complicated of textile fabrics, are made in the most primitive kind of loom. This loom varies very little, if any, from that used at the dawn of history. It consists of two cylinders, on one of which the warp is wound, and the other receives the woven fabric. Each thread is connected with a wooden bar by means of looped harnesses made of twine. These looms are divided into two classes, those having the warp in a vertical position, and those in which the warp is placed in a horizontal position as in the ordinary loom in general use. With a loom of this description, it is evident that the mechanism has nothing to do with the design. The operative makes all the changes by hand according to the plan of the artist. At Gobelin the looms with vertical warps are used exclusively, while at Beauvais and Aubesson, the looms with the warp in a horizontal position are employed. The length of time consumed in weaving these goods seems incredible. At Gobelin the yearly production of one weaver is about one square yard of tapestry. The texture of the Gobelin goods is much coarser than that made at Beauvais, nevertheless, a tapestry weaver at Beauvais produces a much larger quantity of goods, on account of the difference between the two different kinds of looms.—L'Industrie Textile.

—The Indigo Planters' Association in India have petitioned the government to aid in experimental scientific researches in regard to indigo in both the agricultural and manufacturing branches. The officials have agreed to contribute 50,000 rupees for this purpose, providing the Association will contribute 75,000 more.

—Intolerance resides in the mind of man: it is the hate of every enemy of our opinions; its strength increases with the love we bear for our opinions.—De Premoutal.

—An upright man with a crabbed manner is a castle at which the keeper will not let the drawbridge down because the visitor does not rap at the door.—Houssaye.

—The mind of man is strengthened and encouraged by contemplating its power.—Spinoza.

—Without repentance the heart of man becomes a sewer which no water can cleanse.—Delaforest.

—All error is based on a truth which is abused.—Ernest Hello.

—It is easier for the poet to picture the birth of love than to record its duration.—Raymond.

—Women lose their reason rather than their speech.—Commerson.

Titan Colors.

These colors, which are claimed to be fast to acids, are prepared with a boiling dye bath containing the dye stuff to produce the required shade. For dark shades it is advisable to use standing baths, as this method results in a considerable saving of dye stuff, and a less quantity of salt or Glauber's salt is required for the lighter shades, but in all cases such assistants should be added to the bath gradually. The following combinations may be used for this purpose; the quantities are reckoned for 100 lbs. of cotton cloth:—

(A) 2½ to 5 lbs. Phosphate of soda, 10 to 20 lbs. Salt.

(B) 10 to 50 lbs. Salt.

(C) 5 lbs. Oleine oil, 10 to 20 lbs. Glauber's salt, 10½ lbs. Soda ash, 25 lbs. Glauber's salt.

(E) 2 to 3 lbs. Acetic acid, according

to the hardness of the water; 20 to 30 lbs. Salt.

(F) 5 lbs. Alum.

(G) 2½ lbs. Soap, 5 lbs. Soda ash.

After dyeing, the cotton is well rinsed and worked for fifteen minutes in a cold bath containing 10 lbs. spirits salts, 3 lbs. nitrate of soda. The goods are again rinsed and entered into a cold developing bath, where they are worked for one-half hour until the shade is fully developed. For preparing the developing bath, 2 lbs. Fast Blue developer is mixed with 2 lbs. spirit of salt in boiling water, and this mixture added to the cold water which forms the developing bath.

Paranitraniline is used in connection with the Titan Colors, as follows: —2 lbs. of Paranitraniline is placed in an earthen jar, and made into a liquid with ½-gallon of boiling water; then 5½ lbs. spirit salt 34° T. is added without delay to the solution; three gallons of cold water is afterwards added while stirring. The jar is now placed in a current of cold water, and when the temperature has fallen below 55° F., 1 lb. 2 oz. of nitrate of soda, dissolved in one gallon of cold water, is run in as quickly as possible while stirring. The clear solution or diazotized Paranitraniline is added to the necessary quantity of cold water which forms the developing bath, and under agitation 7 lbs. 10 per cent. soda ash solution, and finally 35 lbs. 10 per cent. acetate of soda solution are added. The goods after leaving the dye bath, are rinsed and worked in this bath for one-half hour until the shade is developed. They are then rinsed in cold and hot water and dried.

Aniline Black Resist.

A process for the producton of white or colored patterns on fabrics by a resist on an aniline-black ground has recently been patented.

The invention states that heretofore, in slop-padding or dyeing aniline-black goods and printing a white or color discharge, great difficulty has been found in preventing too great an oxidation of the black, before the printing of a pattern or figure, over oxidation, making the production of a clear cut pattern or figure impossible.

He claims that by his process he can resist the action of the aniline-black. The pattern is printed in a resist suitably compounded, and if a white pattern is to be produced a resist mixture is formed as follows:

Six pounds of a zinc compound, such as oxide, hydrate, or carbonate of zinc to furnish the zinc which is the essential or active element, one-half gallon of water; and one and one-half gallons of starch paste (one pound of starch per gallon). The zinc compound is first thoroughly mixed with the water, and then the starch paste is added, the latter forming the thickening. The resist described is then printed on the fabric to form the pattern and thereafter dried, all as is usual and well-known.

The printed fabric, in order that it may have an aniline-black ground or body, is then either blotched, printed, slop-padded or dyed in a solution of aniline-black produced by any of the recipes well-known to calico printers or dyers, dried in the usual manner, and thereafter the aniline-black is developed by passing the fabric through an aniline aging machine, or by steaming, with or without pressure. The fabric may then be soaped, dried and finished in the usual manner. When the operation is completed it will be found that the parts of the fabric covered by the resist mixture have not been at all affected by the aniline-black color, the zinc arresting the oxidation of the aniline and preventing its development in the parts printed or covered with the resist, and the pattern is clearly and distinctly defined in a manner impossible to achieve by any of the processes now known to the inventor.

He claims the invention to be equally well adapted for the production of colored patterns, by mixing pigments or coal-tar colors, or extracts of dye-woods, with the resist.

QUESTIONS AND ANSWERS

Under this head we undertake to answer, free of charge, to the best of our ability, any pertinent inquiry pertaining to textile matters received from any regular subscriber to the TEXTILE WORLD. Questions should be stated as briefly and concisely as possible. Inquiries pertaining to textile processes, machinery, improvements, methods of management, the markets, etc., are especially invited, as well as any legitimate discussion on the views expressed. All inquiries must be accompanied by the name of the person inquiring, not for publication, but as an evidence of good faith.

For reply to questions that are not of general interest to readers of textile journals, such as those relating to the composition of yarns, analysis of fabrics, etc., we will charge the enquirer with the cost of the investigation.

Stripping Stock from Top Flats.

Editor Textile World:

What causes the cotton to stick to the top flats of a cotton card instead of being taken off by the stripping comb. Although the strippings are very light they stick to the wire. The comb takes only part of them off leaving the flats dirty. The comb is set 7/1000 of an inch from the flats. I have used the burnisher but it did no good? Card grinder (132).

A practical cotton carder says in reply:

"As insufficient data is given with the question to enable one to point out the cause of the trouble, it will only be possible to give a few suggestions as to the cause and remedy.

"The trouble is due either to the condition and adjustment of the comb or to the condition of the clothing on the flats; if experiments with the comb have failed to adjust matters, the trouble must be in the clothing, as the comb will usually clear the flats even when there is very poor adjustment. In setting a comb have the stripper comb arms on a line with the centre of the sprocket shaft to bring the blade in the right position. Set the comb to No. 10 or No. 12 gauge; should the comb be bowed either out or in, don't try to straighten it with a sledge hammer; by moving the comb arms nearer together or farther apart on their shaft the comb can be made to bow in either direction.

"If the comb is properly adjusted and the strips still stick to the flats, it is a sure indication that the trouble is to be found in the clothing; in such cases it is quite likely that the flats have been in contact with the cylinder and the grinder, in order to cover up his mistake has then vigorously applied the roll grinder and the wire has become slightly hooked. No amount of burnishing will remove a hook; a quick, light grinding is the only resource. Reclothe the grinder if it is not in good condition; see that the pulleys are of a size to give at least 900 revs. per minute to the grinding roll. Grind lightly; this will set the clothing right. If too light stripping is being made the stock will not come off clean. Raise the stripping plate a little nearer to the flats; this will increase the amount of strips."

Central.

Scouring Woolen Hosiery.

Editor Textile World:

What is the best formula for scouring woolen hosiery? I want to soften the fabric and felt slightly.

Seventh Day (131).

It is impossible for us to say what formula for scouring, and fulling woolen hosiery, should be used, as we do not know what class of goods are being handled.

There are so many different grades of woolen hosiery, each requiring a treatment in scouring which must be adapted to the conditions of the fibre and finish, that we might lead our correspondent into serious difficulty by recommending a formula which is adapted to one class of goods, but not to the one in question.

On general principles we would say, that a good soap in connection with carbonate of soda crystals or soda ash, would suit any ordinary class of goods. Care should be taken to avoid an excess of alkali, as that makes the fibre harsh.

Book on Designing.

Editor Textile World:

I am a beginner in designing, and would like to study some book that is suited for my needs. Please advise me what work you would recommend?

Ambition (118).

We would recommend Beaumont's Manufacture as a good book for a beginner in designing. It has chapters devoted to the designing and treats of the subject of woolen and worsted manufacturing in general. "Ambition" can obtain information from this work which will form a very good foundation for a later and more extended study of the subject Another work that would be of great

value to a designer is a German work entitled Methodik der Bindungslehre, of which we have recently received a copy of the second and revised edition. While the reading matter is in German, the work can be used to advantage by English readers, as it contains a very complete collection of weaves shown on elaborate colored plates. The price of the book is $2.50, and it can be imported through our office.

Removing Oil Spots from Knit Goods.

Editor Textile World:

What is the best way to remove oil spots from knit goods? And what kind of lubricating oil would you recommend for use in knitting mills?

Oil Smootch (119).

A practical knit goods manufacturer with long experience says, "The best way to remove oil stains from cotton is to boil the goods in sal soda or caustic soda." He adds, that they can be scoured out spot by spot but that is an expensive method, and does not entirely remove the mineral oil; they are apt to show even after a regular bleach; he adds, that he has had great success in using lard oil for lubricating; the lard oil is readily saponified, and, consequently, oil spots caused by this oil are more easily removed. Oil spots in goods resemble all other difficulties; "an ounce of prevention is worth a pound of cure," and it will be found that keeping the machine and bearings clean will require the greatest care to be used in handling oil, will be time well spent.

Cost of Cotton Yarn.

Editor Textile World:

What is the cost of producing No. 10 cotton warp, including manufactory?

Curious Corners (120).

We are unable to give definite information as to the cost of producing No. 10's cotton yarn, the market for the raw material varies so much, and the conditions under which manufacturing is carried on are also so different in different localities, that no estimate would be of much practical value.

We have recently published very interesting articles upon the cost of producing single 20's yarn in Austria, and we expect to have further articles on this subject from time to time, from which can be secured valuable information in regard to the cost and its calculation.

The yarn market is at present in a very demoralized condition. Southern mills have sprung so rapidly that the market has been flooded with cotton yarn, and today there are immense stocks of the yarns, particularly of the low grades which are being pressed for sale. The price at which they are offered is below the cost of production, and we think that our correspondent would come very near the cost of producing any particular grade of cotton yarn today, by adding from 5 to 10 per cent. to the quotations for cotton yarn which appear in our market reports.

Price Fluctuations of Cotton and Cotton Yarn.

Editor Textile World:

Where can I secure information in regard to the fluctuations of prices for cotton and cotton yarn for a number of years back?

Cotton Field (127).

The Textile World is the only publication we know of that gives this information. In the May issue will be found a chart showing the fluctuations of middling uplands cotton at New York, and print cloths at Fall River, from the beginning of 1890 to the 1st of May, 1901. This chart also gives for the same period the fluctuations of wages in New England cotton mills for the current year. These fluctuations are shown by months.

The lines have been carefully drawn in accordance with statistics of price fluctuations during these years, and show at a glance the level reached at any time during the past eleven years. On page 971, of the same issue, will be found fluctuations of price for the three principal grades of cotton yarn from the beginning of 1893 to the 1st of May, 1901. Charts for wool appear on page 855, and for worsted yarn on page 979. These appear monthly in the Textile World, and the lines are carried along to show the fluctuation for the preceding month.

Different Methods of Spinning.

Editor Textile World:

I would like to have you tell me the difference between mule spinning, and throstle spinning, also the different methods employed at the latter process, and what fabric each is used for?

Spindle (125).

Throstle spinning includes all the methods which employ a stationary frame, such as flyer, cap and ring spinning. In mule spinning, on the other hand, the spindles are mounted upon a movable carriage which travels over a space of about six feet to and from the delivery rolls. As the carriage moves out the sliver is drawn finer because the rollers deliver a length of roving less than the six feet over which the carriage moves. After the carriage has moved out as far

as it will go, it remains in this position while the spindles revolve and put twist into the yarn; when sufficient twist is given the yarn, the carriage moves back to the rollers, and at the same time the yarn is wound on the bobbin which is fastened on the spindle.

Throstle spinning includes flyer, cap, and ring spinning. Each of these methods employ two sets of drawing rolls through which the sliver passes; the forward set moves faster than the rear set, and consequently, elongate or draw the sliver finer. From the front roller the sliver passes to the spindle which is held in a stationary frame, and revolved by bands.

The difference between flyer, cap and ring spinning, consists in the arrangement of the spindle and winding device. In flyer spinning, there is a fork called the flyer, which revolves with the spindle and effects the winding. In cap spinning a metal cap is held over the spindle, the bobbin and spindle move up and down inside this cap, and the bottom edge of the cap, which is stationary, guides the yarn to the bobbin. In ring spinning a ring is fastened in a movable frame, and the spindle stands inside the ring; on this ring is a loose traveler which revolves freely around the circumference. The thread is passed through this traveler, and as the spindle revolves the traveler is carried around with the thread, and the drag of the traveler on the ring causes the yarn to be wound on the bobbin.

Blanket Yarn.

Editor Textile World:

Which is the better for blankets, a yarn drawn soft and lofty or one drawn firm and rather solid?

Corner (76).

The method of drawing to be used for woolen yarn depends upon the stock. Generally speaking all woolen yarn should be drawn as tightly as the material will permit, as this method of drawing produces a stronger and smoother thread. Drawing quick, before much twist is given to the yarn, is necessary on certain grades of stock, and the question of draft must be determined by the spinner to suit the stock in hand.

Quick drawing is apt to cause twits in the yarn, and as the twist runs into the fine places it leaves the coarser parts soft and fluffy. If however the yarn is smooth and free from twits, the twist is more evenly distributed, and with the same amount of twist a harder appearing thread is produced.

The particular effect desired in the finished blanket must determine whether a soft or hard yarn should be used, and we advise Corner to make his yarn as smooth as possible, and regulate the softness by the twist.

Chenille.

Editor Textile World:

Where can I purchase chenille like the enclosed samples?

Cider (109).

We have answered by mail.

Stockinet in Flat Goods.

Editor Textile World:

Where can I obtain stockinet in flat goods for cap cloth?

Flat (111).

Answered by mail.

Bleaching Cotton Knit Goods.

Editor Textile World:

I am making cotton and woolen mixed knit goods, and bleaching the wool with sulphur. I would like information as to how the cotton can be bleached so as to resemble the wool in color; it now comes out too white and bright.

Bleach (113).

We believe there is no way of regulating the shade produced by a bleach, except by tinting, or varying the amount of bleaching material.

We would advise our correspondent to tint his goods, if he desires to alter their shade materially; if, however, he only wishes to make a slight change, we think he will have better success by reducing the strength of his bleach.

Equipping a Woolen Mill.

Editor Textile World:

I have two opportunities in my town to invest in the woolen business. One is offered by a woolen mill already established, whose owners desire to obtain additional capital with which to extend their business. The other chance is afforded by a mill property without machinery, which is now offered for sale. The first named mill has been successful in years past in the manufacture of woolen cassimeres. I would like to have your advice as to which enterprise to embark in. In case you advise the new mill, please state what woolen machinery the buildings would accommodate.

Idle Cash (88).

If a choice must be made between the improvement of an old mill and enlargement of an already established business or the starting of a new one, other things being equal, and he knows little about the business, we have no hesitation in advising "Idle Cash" to invest in the old enterprise if the parties are good

manufacturers. The situation in the woolen goods industry in this country today is such as to make it extremely problematical as to whether any new enterprise in this line of business would succeed unless shrewdly conducted by a man who thoroughly understands every detail. The business is now suffering from over production or under consumption, and for this reason new enterprises not only have the keenest competition to face but make the conditions still worse for those mills that are already established. On the other hand, one great trouble with the woolen industry is the poor equipment of many of the mills. If the mill already established and referred to in the inquiry requires money for the improvement of the equipment in order to reduce the cost of the goods, such an investment could be profitably made. Our woolen mills require a wider outlet for their goods, and as the foreign market is shut off from them, and the domestic market is already well supplied, the only way to increase the consumption of goods appears to be in reducing their cost to the consumer. This can be done only by reducing the mill cost. If our correspondent decides to equip the new mill, we advise selecting the best machinery throughout and arranging the machines so as to avoid as much as possible the carrying of stock to and fro from one to the other. We will not undertake to advise in detail as to the arrangement of machinery. This can only be done intelligently by one who is on the spot, familiar with all the conditions, and knows the class of goods that is to be made. The buildings are 40 by 232, two stories, with boiler and engine rooms in a separate building. The width (40 feet) is rather narrow, and, in fact, too narrow to place a set of woolen cards (two breakers and a finisher) in a straight row; this is not a serious objection, because the narrow width has advantages for spinning, weaving and finishing which more than counterbalance any inconvenience that may be experienced in setting the cards in an irregular way. The space is sufficient to accommodate 4 sets of machinery, cards 48 inches wide, with cylinders 60 inches in diameter. The spinning should consist of mules of 200 spindles each, set in pairs, so that each spinner may run two machines, or 400 spindles. The looms can be arranged in two rows, with a window opposite each loom. We would advise placing the cards next to the picking room on the second floor, the spinning on the same floor, and the weaving and finishing on the first floor.

Growth of Worsted Industry in the United States.

Editor Textile World:

What has been the increase of worsted machinery in the United States in the past ten years?

Billy-Boy (121)

The worsted combs form the best basis on which to calculate the growth of the worsted industry. According to the Textile World mill reports, there were 855 worsted combs in the United States in 1890, and 1510 in 1900, showing an increase of 76 6/10 per cent. in ten years.

Calculating Pick Gears.

Editor Textile World:

Where can I get information as to how to change the loom pick gear in order to get a certain number of picks per inch?

Pick and Pick (121).

Marsden's Cotton Weaving will give you information as to the calculation of gears required for any number of picks; the price of this work is $3.00. It is a treatise on weaving, and is a very valuable hand book of the subject. If the rule for calculating gears is all that is required, we would suggest that our correspondent write to the loom builders and ask them to send their catalogue in which the rules for calculating loom gears are given. We think they will be found in catalogues of most loom builders.

Making Knit Goods Unshrinkable.

Editor Textile World:

What is the process for rendering ril knit goods unshrinkable?

Monte Cristo (123).

A practical knit goods manufacturer of long experience says: "I have found that the shrinkage of woolen knit goods can be prevented by first scouring them in boiling water, and then taking them directly from the boiling water and immersing them into cold running water. Goods treated in this way will not shrink as much as those which have not been so treated. Of course this process causes some shrinkage during the operation, and if goods are to be subjected to it after being made into garments, the size should be somewhat larger in order to allow for this shrinkage.

Frederic Haigh, 660 E. 23d St., Paterson, N. J., has a process by which he claims to render flannels, dress goods, underwear, and hosiery unshrinkable. Further information in regard to it can be obtained by communicating with him.

New Publications.

A Treatise on Weaves and Cloth Analysis, by Franz Donat. A Hartleben, Wien, 72 plates, 648 figures, 4 cloth samples. Price $2.50.

We have received a copy of the new and revised edition of this work which was first published in 1893, and which has since reached a sale of 25,000 copies. The systematic plan of the book merits the strongest approval. The various methods of interlacing warp and filling are classified, and clearly explained. In this way the book becomes a glossary of weaves, and at the same time the student gets a clear view of the subject both in detail and as a whole. The elaborate colored weave diagrams are a noteworthy feature of the book. Although the text is in German, the diagrams alone make the book of great value to English readers. Some of these diagrams have as many as five colors in order to show the principle on which double cloth weaves are constructed. Valuable chapters are devoted to doup and velvet weaving and the production on harness looms of wide diagonal and figured effects which would ordinarily require a Jacquard attachment.

The explanations are clear and concise, and throughout the work all superfluous matter is excluded. The concluding section treats of cloth analysis and calculations. This part also possesses great merit, although more particularly adapted to foreign methods. The work will prove valuable both to the beginner and to the expert in designing and weaving It can be imported through our office.

Finishing Materials and their Use Friedrich Polleyn A. Hartleben, Vienna and Leipzig. 454 pages, illustrated, price $2.00. We have received a copy of the second edition of this German work, which has been very popular in the different branches of the textile industry in continental Europe. The following abstract of the contents will give some idea of the scope of this German work:—Finish, finishing materials and finishing; Materials for Stiffening and Lustering; Variations in Starch and Tests for Same; Dextrine; Tragacanth; Vegetable Gums; Albumin; Casein; Glue; Starch and Potato Syrups; Softening, Weighting, Filling, Antiseptic, Tinting and Miscellaneous Finishing Materials; Preparation of the Finishing Pastes; Directions, Instructions; Finishing of Cotton and Line Goods; Sizing; Finish of Woolen Goods; Silk Finishing; Various Kinds of Finish; Waterproofing; Fireproofing; Use of Finishing Materials; Finishing Machinery; Tests for Finish.

The author states that in compiling this work, he has availed himself of every source of information including the latest patented processes, thus bringing the work up to date.

Yarn Numbering and Ruling, With Comparative Yarn Tables, Heinrich Kutzer. A. Hartleben, Vienna and Leipzig. 41 pages. Price $1.00. This German book explains the many systems of yarn numbering in use throughout the world. The first section takes up yarns made from vegetable fibres as follows: Flax; Tow; Jute; Nettle; China Grass; Ramie; Cotton; Glazed Yarn, etc. Section II.: Animal Fibres; Combed Wool; Carded Wool; Silk; Tables Showing Standard Lengths and Weights of each System; Comparative Yarn Tables. Various yarn scales are described, which can be quickly adjusted to indicate size of yarn by different systems of yarn numbering. Such a scale might prove a great aid in bringing the metrical system of yarn numbering into general use.

Oil Engines, by A. H. Goldingham, fully illustrated, price $2.00.

The increase in the use of oil engines makes this work particularly timely. Very little literature exists on the subject, and owing to ignorance in regard to it, very often motors do not receive the proper care, and are unjustly condemned.

The object of this work is to supply manufacturers and workmen with practical information in regard to installing apparatus and caring for oil engines. No other subject is treated in this book, and it is believed to be the only published work devoted entirely to the oil engine.

The following synopsis of the table of contents will give our readers an idea of the ground covered: Chapter 1, Classification of Oil Engines; Vaporizers; Igniting and Spraying Devices; Chapter 2, Designing Oil Engines; Chapter 3, Testing Engines; (this chapter is based on the writer's experience in the testing room); Chapter 4, Cooling Water Tanks; Chapter 5, Oil Engines, Driving Dynamos; Chapter 6, Oil Engines, Air Compressors, Water Pumps, etc.; Chapter 7, Instructions for Running Oil Engines; Chapter 8, Repairs; Chapter 9, Various Engines Described.

First Aid to the Injured, by H. Drinkwater, M. D. Price 40 cents.

This little book treats of the proper methods of caring for injured persons. Besides the reading matter there are many illustrations showing the structure of the human body and manner of caring for injured persons. By means of these half tone illustrations, one is able to understand how to care for injured people, nearly as well as if they were witnessing an actual demonstration of the operation.

This book should be read carefully by all, and kept within easy reach for reference in case of need. It would be a good plan to have it in every mill. When a person is injured he needs help and needs it at once; owing to the ignorance of bystanders much needless suffering is caused and life sacrificed because the injured person has not received at once the aid which is so easily given when one knows how.

Engineering Estimates and Cost Accounts, by Francis G. Burton, ex secretary and general manager of Milford Haven Ship Building & Engineering Co., second edition, 131 pages, price $1.50.

The second edition of this work varies but little from the first, which has proved so useful in solving the problem of estimating cost in engineering work.

We cannot give a better idea of the plan of this work than by quoting from the preface by the author as follows:

"The difficulties I have endeavored to grapple with in both estimates and cost accounts, are such as I have met in actual practice, and such as must frequently present themselves to the staff of an engineering establishment. I cannot too strongly express my conviction that no method of estimating or costing will be satisfactory, unless the cost clerk possesses the most intimate knowledge of

the business, and is sufficiently skilful and independent in practice to vary his forms of account to the difficulties which may from time to time arise. Uniformity of principle must certainly be maintained but this does not justify pettifogging uniformity of detail."

The following is an abstract of a table of contents: Engineering Estimates Chapter 1, Boilers; 2, Gas and Other Engines; 3, Steamships; 4, Catalogue Machinery and Foreign Estimates.

Engineering Cost Accounts: 5, Cost Accounts; 6, Division of Cost Accounts 7, Department Accounts; 8, Depreciation Loose Tools; 9, B and C Cost Accounts; 10, Cost Accounts of Small Works; 11, Foreign Contracts; 12, Reserve Funds.

How to Run Engines and Boilers, by Egbert Pomeroy Watson, 153 pages, illustrated. Price $1.00.

This is a valuable hand-book of engine and boiler practice, written for the instruction of engineers and steam users generally. It is systematically arranged, and the man in charge of engines and boilers will find it to contain the information which he requires in his daily work. A feature of the book, which impresses the reader forcibly, is the thoroughly practical manner in which the subject is treated.

Induction Coils, by H. S. Norrie, 261 pages, illustrated. Price $1.00.

This work gives instructions as to how to make, use and repair induction coils. It has been thoroughly revised, and partly re-written with a view to bringing it up to date to correspond with the present advancement of electrical science. The new matter includes coils for gas and automobile engines; medical coils; concise directions for operation and repairs; new forms of contact breakers, including electrolytic and mechanical gas lighting apparatus, also primary and secondary batteries; the chapter on X-ray apparatus is entirely new; a chapter on wireless telegraphy has been added. Following is an abstract of the table of contents: Coil construction; contact breakers; insulations and cements; condensers; experiments; spectrum analysis; currents in vacuo; rotating effects; gas lighting; batteries for coils; storage or secondary cell; Tesla and Hertz effects; the Roentegen rays and radiography; wireless telegraphy.

Musee Retrospectif De La Classe 81 Fils et Tissus De Lin, De Chanvre, etc., Paris Exposition.

A report of the sub-committee in charge of class 81 at the Paris Exposition. This department included linen and hemp yarn and cloth. This book contains an interesting historical sketch of the industry, by E. Widmer, portraits of noted inventors, and catalogue of the articles exhibited.

Wool Grease, Recovery, Composition, and Testing, by Prof. Ed. Donat and B. M. Margosches, Chemical Engineer, Ferdinand Enke, Stuttgart, Germany. Price $1.00. This book of 106 pages, published in German, treats of the extraction of wool fat from the fibre, and its subsequent purification and testing for industrial purposes. It is illustrated with numerous cuts of the apparatus required in handling the grease. This work contains a great amount of information upon the subject, which is systematically arranged.

Mercerizing of Cotton. By Paul Gardner, 145 pages, 57 Illustrations. Julius Springer, price $2.50.

This work gives in concise form an account of the processes and machinery employed in the mercerizing of cotton yarn and cloth. The work is divided into five sections, as follows: 1, Methods of cotton relating to mercerizing in general; 2, Methods from a chemical standpoint differing from the preceding ones; 3, Mechanical improvements; 4, Theoretical and practical consideration of mercerizing under tension; 5, Processes employed in textile manufacture which employs mercerization as a means.

Austrian Textile Machinery at the Paris Exposition. By Siegmund Edelstein. Leipzig-Gohlis. Germany.

This is a pamphlet containing the articles and illustrations contributed by Prof. Edelstein to the Zeitschrift fur die gesamte Textil-Industrie. It places these interesting articles in a convenient form for reference. The illustrations of the machinery add much to the value of the work.

Directory of the Hosiery and Knit Goods Manufacturers of the United States, Canada and Mexico.

We have received the 1901 edition of the above directory, which is its nineteenth year of publication. It is compiled with its usual care and accuracy, and contains not only the directory of knitting mills, with full particulars about each mill, but a list of jobbers and dealers in knit goods. The book is of convenient size, and is indexed for convenient reference. It is published by the Textile Record Co. Price $2, and may be obtained from their New England office, 170 Summer St., Boston, Mass.

The Legal Status of the Industrial Worker in Germany. By Franz Burchardt. Franz Valen, Berlin. Price $1.25.

A book of 108 pages giving the principal sections of the labor laws in Germany. It places in compact form for the use of students of economical questions, as well as manufacturers and workmen, the provisions affecting the German laborer in his daily work. The book can be imported through this office.

Business Literature.

The Year Book for Colorists and Dyers, by Herman A. Metz, N. Y.

Through the courtesy of Victor Koechl & Co., we have received a copy of the third volume of this Year Book. Part I. Tables, contains a variety of tables which cannot fail to be useful to manufacturers, such as those showing the equivalence of various units of the metric and other systems of weights and measures, comparative thermometer tables, and a table comparing the Baume and Twaddle Hydrometers with the specific gravity system; Part 2, is a glossary of chemical terms which will

prove very useful to dyers and chemists; Part 3 contains a description of the more important patents issued during the year for dyes, dyeing apparatus, and processes in allied industries, both in this country and abroad; Part 4, Notes on Processes; contains an account of the important processes of bleaching, scouring, dyeing, finishing and printing, which have been brought to the attention of the public during the year; Part 5, Education; contains a description of the various American textile schools and associations, new books relating to textiles, and allied industries published in this country and abroad; Part 6, List of dye stuffs and dye manufacturers and agents, alphabetically arranged, which the manufacturer and dyer will find very useful. Part 7, Miscellaneous Notes. In this section various articles of interest to the textile trade are published.

The work ends with an index of contents. We advise our readers to secure a copy of this hand-book, and are confident they will find it very useful for reference.

Annual Report of Silk Association of America. We have received the 29th annual report of this association. It contains the information usually embodied in this publication, including the secretary's annual report, the various interesting papers relating to silk industry presented at the last meeting, and statistics of the industry.

Mechanical Draft. American Blower Company. This is a neat booklet showing illustrations and price list of mechanical draft apparatus, manufactured by the American Blower Co., Detroit, Mich. The illustrations are usually complete.

Tanks, Towers and Tubs. W. E. Caldwell & Co., Louisville, Ky. This is a catalogue of the tanks, towers and tubs built by this company, and should be in the possession of every user of such apparatus.

The Barber Knotter. Barber & Colman, Boston, Mass. This booklet contains some very fine engravings showing the Barber Knotter, which is being introduced rapidly into our cotton mills, and is effecting a large economy in the labor cost of spooling. A series of engravings show the machine in the different stages tying the thread.

Thirty Days After. B. F. Sturtevant Co., Boston, Mass. A folder illustrating the ruins of the Sturtevant Blower Works after the fire of April 14th also the new machine shops which this energetic firm already have in operation for turning out their line of goods; it records an interesting example of energy and enterprise.

Central Station Experiences. Power Publishing Co., New York. This book contains the articles which have already appeared in Power, and which amused and instructed readers of that journal. They succeed admirably in imparting information on a technical subject by means of entertaining dialogues and anecdotes. One cannot fail to be both instructed and amused by a perusal of this book; this is a method of treating such subjects that should be more generally adopted.

Friction Clutches. The Eastern Machinery Co., New Haven, Conn. In a pamphlet of fifty-six pages the various styles of friction pulleys manufactured by the Eastern Machinery Co. are described and listed with illustrations of the clutches and hoisting machinery.

Address of Jno. C. Freund. We have received a copy of Music Trades, containing the address of Mr. Freund, delivered at the dinner of the National Piano Manufacturers' Association, May 16th. He made some good points in his comparison of the trade and daily papers.

Elevating and Conveying Machinery. We have received a copy of a circular which the Jeffrey Mfg. Co. are distributing to the trade containing half tone illustrations of the various types of their machinery in actual operation. It is a very effective means of giving the reader an idea of the variety and extent of different lines of hoisting and conveying machinery built by this company. Any one interested can secure a copy by Writing the Jeffrey Mfg. Co., Columbus, Ohio.

Graphite Productions. This pamphlet contains an interesting account of the graphite products of the Joseph Dixon Crucible Co.; there are numerous illustrations of their products also the work shops and mines in different parts of the country.

Useful Books for Practical Men, Spon & Chamberlain, N. Y. We have received a copy of the catalogue of new books issued by Spon & Chamberlain, 12 Cortlandt St., N. Y. We find many books listed, which cannot fail to be useful to mill men. This list will be mailed to anyone upon application to the publishers.

Official Manual of the National Association of Woolen and Worsted Overseers.

This manual begins with a list of officers, then follow a brief history of the Association, copy of the Constitution and by-laws, list of members, by-laws of the beneficiary department, payments made on account of the death of members, obituary of John Mulrooney, and articles on the art of finishing woolens and worsteds, color matching, woolen manufacturing, chroming wool, carbonizing and dyeing, carding, woolen spinning room, in the woolen card room, wool sorting, concluding with a glossary giving definitions of various technical terms employed in woolen and worsted manufacturing.

Points on the Art of Steam Finishing. Birch Bros. Price 10 cents.

This is a neat pamphlet containing an interesting article on steam finishing and illustrations of the steam finish, wet finish and sewing machines, built by Birch Bros., Somerville, Mass.

The Dodge Iron Split Pulley. Dodge Manufacturing Co., Mishawaka, Ind.

This is a pamphlet of thirty pages containing descriptions and illustrations of the Dodge pulleys.

Mechanical Draft, B. F. Sturtevant Co. This is the third edition of Walker B. Snow's lecture on "The Influence of Mechanical Draft upon the Ultimate Efficiency of Steam Boilers" issued by the B. F. Sturtevant Co. Boston, Mass. It treats of the different methods of application of fans for producing boiler draft, of the relative cost as compared with a chimney, of the possible economy in first cost of boilers, running expense for fuel, etc. Copies may be obtained upon application to the Sturtevant Co.

The American Angora Goat Breeders' Association, 277 Live Stock Bld. Kansas City, Mo.

A pamphlet of 18 pages giving the articles of the Association, by-laws, rules and regulations, and list of members. The Angora goat industry is growing in this country, and this association will be of great value in disseminating information, and promoting the adoption of the best method of breeding and care of the animals.

Sturtevant Blowers, Catalogue 115. We have recently received this catalogue from the B. F. Sturtevant Co., Boston, Mass. It contains illustrations, descriptions, and price list of forges, blowers, fans, planing mill exhausters, counter shafts, blast gates, disc fans, propeller fans, steam plate exhausters and fans, steam and electric fans, engines, motors, generating sets, hot blast apparatus, exhaust heads, steam traps, and various special devices manufactured by this well known firm. It is of convenient size suited for desk use, and will be found useful to all parties interested in this line of goods.

Who Uses Mechanical Draft? This is the title of a pamphlet issued by the B. F. Sturtevant Co., which contains a list of the concerns now using mechanical draft. No testimony could be stronger in favor of this system than the long list of names of the leading manufacturing concerns in all parts of the country, who now have mechanical draft plants installed in their works.

New Color Cards Recently Received.

—Discharge Prints On Cotton Yarns, W. J. Matheson & Co., N. Y. This card shows five samples colored with the Diamine colors, discharge printed with zinc dust and acetate of tin discharges. Full directions are given for the processes.

—Diamine Colors on Wool and Cotton Mixed Yarn, W. J. Matheson & Co., Ltd. This card shows ninety shades colored with the Diamine colors on yarn spun from a mixture of wool and cotton. Formulas and directions are given for coloring. Uniformity of shade is claimed for these colors, as well as a simple method of application.

—Titan Colors, Reed Holliday & Sons. This card shows seventy shades dyed on unbleached cotton cloth with the Titan colors, full directions and formulas are given.

Immedial Sky Blue, Wm. J. Matheson & Co., N. Y. This booklet gives full directions for dyeing Immedial Sky Blue on cotton yarn, loose cotton, and piece goods; also in combination with Immedial Blue C.

Immedial Black N B and N G. This card shows four samples of cotton yarn colored with Immedial Black N G and N B, two of them being taken before, and two after treating with bichrome and acetic acid.

Immedial Sky Blue, Wm. J. Matheson, N. Y. This card shows two large samples of cotton cloth, one a light, the other a dark shade, colored with Immedial Sky Blue in a standing bath. Formulas are given, and instructions for coloring can be found in pamphlet No. 2210.

Colors Fast to Fulling for Fancy Effects, W. J. Matheson & Co. This card shows twenty-four bright colors on wool, for producing fancy effects in mixed goods. Full directions for dyeing are given in English, French and German.

Industrial News.

—The American Tool & Machine Co., Boston, Mass., has moved its New York office from 41 Park Row to the St. Paul Building at 220 Broadway. G. F. Kenney is in charge as heretofore.

Waste of Bleaching Powder.

A considerable loss of chlorine takes place indirectly from the bleaching powder, and, unless care is taken to prevent it, in the course of a year pounds' worth would be lost. A very good way is to roll the hogshead to the desired position, then with a hand saw cut three or four staves 6 in. either side of the centre, making a hole about 12 in. square. The hole thus made can be nearly on top. The shovel can be put through the hole and the bleach taken out as required. Then, says the Dyer and Calico Printer, as the contents of the cask are used, it can be rolled toward the operator, bringing the hole nearer the floor, until the hogshead is entirely empty. A piece of stout felt should be nailed to the top edge of the hole thus made, so that when the bleach is not being removed the hole in the hogshead can be closely covered by the felt. This prevents the free access of air. It also keeps out the dirt, and the bleach retains its full strength until every particle in the hogshead is used, and does not get dirty. Soda ash, Farina, Epsom salts, Glauber's salts, and similar articles which are always affected by damp should be stored in dry places, where water cannot get to them. Take care of empties; see that before returning to their owners they are kept under such conditions that they will not deteriorate in value. This applies more particularly to iron and tin drums. Often these are simply left in the open, for wind and weather to do what they will. Take care of them.

Dye House Machinery.

In many places much attention will be given to keeping the machinery clean, and yet the shafting which transmits the power to the machines if often sadly neglected. The bearings are allowed to get out of register; to become badly worn, worse still, to get dirty; and too much oil is used. What is the consequence? In the first place, there is a loss of power, which tells its tale in the coal bill, owing to the friction which occurs. Worse still, from a colorist's point of view, owing to the large quantity of lubricant used, oil is thrown off, which causes spots on the goods, the cause of which is not always easily traced. Sometimes the workmen notice the oil being thrown off, sometimes they do not. Putting the bearings in good order will put an end to this trouble. Sometimes, says the Dyer and Calico Printer, troubles happen with belts and friction clutches, due to imperfect lubrication, to oil working into places where it is not wanted, and to dirt being in the wrong place. When troubles arise in such cases it is always best to have a good clean up; see that all oil channels are clear, and free from dried-up oil, that no oil can get on to the working surfaces in any way. While bearings require to be lubricated, too much oil is a bad fault, for it often leads to oil being thrown off the bearings on to the goods, and spots being thereby produced.

Mechanical Draft.

One of the most interesting features of the equipment of the new Olympia Mills at Columbia, S. C., is the mechanical draft apparatus. The tall chimney which has heretofore been such a distinguishing feature of a cotton mill is completely done away with and for it is substituted a short steel plate stack extending barely above the roof. Draft is produced by two 14 feet Sturtevant fans driven by direct connected engines. An outer shell surrounds the stack, and through the annular space between, air is drawn from the atmosphere down into the fan room. The heat thus acquired is further increased by radiation from the fans. This hot air is finally drawn to the fires through ducts extending beneath the ashpits. The entire mechanical draft plant was designed and built by the B. F. Sturtevant Co., of Boston, Mass.

Iron Split Pulley.

The Dodge Mfg. Co., Mishawaka, Ind., are meeting with much success in the manufacture of metallic as well as wood pulleys. For many purposes iron pulleys are indispensable. The Dodge Standardized Split Pulleys place iron pulleys for any place within the quick reach of all. The advantages of split pulleys are now generally recognized. Everyone having experience with power transmission knows that the old-fashioned iron pulley can be used on but a single size of shaft for which it was made, that the old-fashioned pulley if made of solid style cannot afterwards be split, and that for these reasons the old-fashioned cast iron pulleys have never been satisfactorily supplied from stock goods. This difficulty has been removed by the Dodge iron split pulley with standardized bores and interchangeable iron bushings. The following advantages are claimed for the Dodge iron pulleys: they can be used on shafts of different sizes by the aid of interchangeable bushings; in case of necessity the pulley can be quickly changed from one sized shaft to another; any size fitting any shaft can quickly be obtained from the stock of the nearest dealer; accurate proportions and correct finish; convenience of key-seating pulleys originally furnished with set screws only by simply dressing out ends of bushings; the smoothness of rim when split, the split being a fracture instead of a cut, and the rim ends fitting accurately into a rigid position.

The Dodge capillary bearing is an important improvement in power transmission, and should be examined by every one interested in the subject. Further information in regard to their products can be obtained from the Dodge Mfg. Co., Mishawaka, Indiana.

Patent Decision.

The U. S. circuit court district of Mass. has handed down a decision in favor of the plaintiff in the case of the Universal Winding Co., against Thorwald Hansen, from which we quote as follows:

"For perpetual injunction and for reference to a master, . . . It is ordered, adjudged and decreed that claims 1, 2, 3 and 4, letters patent of the U. S., granted unto Simon W. Wardwell, Jr., No. 536,672, for cop winding machine, dated April 2, 1895, are good and valid claims; and that the said Simon W. Wardwell, Jr., was the original and first inventor of the improvement described and claimed in said claims; and that the said defendant has infringed the said claims; . . . that the complainant recover of the defendant the profits which he has received or made, or which have accrued to him from said infringement by the manufacture, use or sale of the improvement described . . . at any and all times since the second day of April, 1895, and in addition thereto the damage which the complainant has sustained thereby. . . . That a perpetual injunction be issued against the defendant according to the prayer of the bill."

This decision still further strengthens the position of the patents on the winding devices of the Universal Winding Co. Our readers will recall that this company secured a final decree in their favor in the case against the Willimantic Linen Co.; since that decision the Universal Winding Co. has received from the patent office additional patents on mechanism for and on the method of winding cops.

—The B. F. Sturtevant Co., of Boston, Mass., recently received the following unsolicited letter from the Widdicomb Furniture Co., Grand Rapids, Mich., which speaks for itself. "Enclosed we hand you check for exhaust head, which was applied yesterday and found to be the most efficient device for the purpose the writer has ever seen. The condition of the atmosphere this morning is one of extreme moisture, which certainly would display any spray passing out

with the steam, but not a particle of moisture can be found in the air, and that even within 12 inches from the exhaust steam. As we have to purchase our water supply the device will soon pay for itself."

Emperor William Wants Quiet.

The New Process Raw Hide Co., Syracuse, N. Y., has recently shipped one of its New Process noiseless pinions to Germany to be used on the private yacht of Kaiser Wilhelm.

New England Cotton Manufacturers' Association.

Charles H. Fish, of Dover, N. H., has been elected President; Herbert E Walmsley, of New Bedford, Mass., Vice President; and James R. MacColl, of Pawtucket, R. I., one of the Directors of the New England Cotton Manufacturers' Association.

The Board of Government have decided to hold the 71st meeting of the Association at the International Hotel, Niagara Falls, N. Y., Sept. 25-26, in order that the members may have a convenient opportunity to visit the Pan-American Exposition.

Overseers Convention.

The semi-annual convention of the National Association of Woolen and Worsted Overseers was held in the United States Hotel, Boston, Mass., Wednesday May 15th. The meeting was called to order by President Brennan, Alfred E. Jones of Putnam, Mass., was acting secretary. Appropriate resolutions were adopted upon the death of John Mulrooney, late Secretary of the association. Nine applications for membership were received and accepted.

A paper was read by C. P. Brooks of New Bedford, upon the advantages of the correspondence system of education in the textile trades. Thos. Kershaw, manufacturer of the Kershaw feed. exhibited and explained to the members an attachment for Apperley, Bates or Kershaw Feeds for woolen cards. A discussion followed as to the best speed for the cylinders of woolen cards on various kinds of stock.

The meeting then adjourned. The next session will be held on the third Monday of November at the United States Hotel, Boston.

The American Moistening Co.

The following firms have recently placed orders with the American Moistening Co., for humidifiers: Messrs. Alb. & E. Henkels, Schenectady, N. Y., Champlain Silk Mills, Whitehall, N. Y., Williamstown Cotton Mills, Williamstown, S. C., The New York Mills, New York Mills, N. Y., Steere Worsted Mills, Providence, R. I., Hamburger Cotton Co., Columbus, Ga., Kesler Mfg. Co., Salisbury, N. C Gibson Cotton Mills, Concord, N. C., Proximity Mfg. Co., Greensboro, N. C., William Clark Co., Westerly, R. I., Attawaugan Co., Killingly, Conn., Fountain Inn Mfg. Co., Fountain Inn, S. C., and the Dwight Mfg. Co., Alabama City, Ala.

Lowell Textile School.

The graduating exercises of this school took place May 23d, according to the following program:—

Music, Hibbard's Orchestra.
Address, James T. Smith, Clerk of Corporation.
Address, Trustee Thomas F. Connolly.
Music, Hibbard's Orchestra.
Address, Trustee Edw. D. Holden.
Address, Trustee Edw. W. Thomas.
Address, Trustee J. L. Chalifoux.
Address, Principal W. W. Crosby.
Presentation of Diplomas, A. G. Cumnock, President of Trustees.
Music, Hibbard's Orchestra.

Following is a list of the graduates of the evening school:—

Cotton Spinning:—Thomas Barnes Hitchcock, Frank S. Willey, Paul Bancroft Wesson, Edward S. Swift.

Woolen and Worsted Spinning:—Ernest Nelson, William J. Jones.

Woolen Spinning:—Thomas Barnes Hitchcock, Daniel F. Donovan, Thomas Farrell, Paul Carl Burghardt, Charles Henry Holgate.

Worsted Spinning:—William Aspinwall, Edward J. Scanlon, Walter Killerby, Hudson Peel, Alfred Law, Archibald Grant, Michael Grourke, Bennett Whitehead, Fred Smith, Ernest W. Chippendale, Daniel Hill, Henry Davis.

Designing:—Noah Brooks, William Oscar Buzzell, John James Cheetham, Thomas Barnes Hitchcock, Ralph Hunter, Wilfred Lord, Jackson Chadwick Hinge, John T. Noble, Hiram Leland Reynolds, Edward Burnett Saunders.

Chemistry and Dyeing:—Isaac F. Williamson.

Weaving:—Hugh B. McQuade, Philip Shannon, Frank Morris, Frank M. Berry, William Frame, Herbert Cowdell, William A. Evison, John H. Gagan, Noah Brooks.

—The St. Croix Cotton Mills, of Milltown, N. B., one of the mills controlled by the Canadian Colored Cotton Mills Co. Ltd., has placed a large order with H. G. McKerrow & Co. for intermediate and finisher lappers, slubbing and roving frames. The speeders will be built by the well known firm of Messrs. Tweedales & Smalley of Castleton, England. The same firm has received this week a second repeat order from the Conanicut Mills of Fall River, Mass., for speed frames of Tweedales & Smalley's make. The Skenandoa Cotton Co. of Utica, N. Y., have placed their order for a complete set of the Montfort combing machines, which will be supplied by Schwartz and McKerrow, the American agents for these machines.

—Vickers, Sons & Maxim, the largest manufacturers of war material in the world, who have immense works in England and supply all the foreign governments, have recently equipped their plant with Cross Oil Filters, manufactured by the Burt Mfg. Co., of Akron, Ohio.

Indigo.

Referring to the competition of the artificial indigo with the natural product, an India journal says that the Germans are mistaken in their estimate of the cost of natural indigo. During recent years, much attention has been given to the subject of reduction of the expenses in connection with the cultivation of indigo, and experiments have led to very promising results.

The planters of the province of Behar have made considerable reduction in the cost of producing indigo, and by the Rawson process of oxidation have found that they could increase the production more than 25 per cent. at an insignificant increase of cost, and without the necessity of any chemical process being employed. It is expected that during the coming season this method will be adopted by many in the Behar district.

The Hancock experiments, which have been carried on for some time past, have resulted very favorably. In some cases, an increase of 140 per cent. in the product of dry indigo, as compared with the product secured by old methods, was secured. The article proceeds to state that with the reduction in the cost of the natural product, and the increase in the cost of artificial indigo due to the rise in the price of tar and coal, India will be placed in a very advantageous position for meeting the competition of the artificial product. This is the most optimistic utterance we have heard from East Indian sources for a long time.

New Bedford Textile School.

Among the southern students who have atended the New Bedford Textile School this year are Mr. Guy P. Stubbs of San Antonio, Texas; Eugene Leman and Andrew Currie, Jr., of Shreveport, La.; Thomas J. McNeely of Salisbury, N. C.; John W. Osborn of Evansville, Ind.; E. Hope Forbes of Crowders Creek, N. C., and Arthur P. Rogers of Latta, S. C.

The fact of New Bedford being the centre of the fine yarn industry and a city where the largest amount and greatest variety of fancy cotton goods is manufactured, together with the fact that the New Bedford Textile School makes a specialty of cotton manufacturing, has caused this southern interest in the New Bedford Textile School.

Addition to Plant.

The New Process Raw Hide Co., Syracuse, N. Y., has recently added considerably to its equipment by the purchase of new machinery, including 3 Gleason Bevel Gear Planers, which plane the teeth accurately to cone lines, and an additional Automatic Spur Gear Cutter, and is now in the market to make metal gears to order in addition to its well-known New Process Noiseless Pinions.

Effects of the Fire.

The B. F. Sturtevant Co., of Boston, Mass., is rapidly recovering from the effects of the fire of April 14th, which affected only the engine and electrical departments. With only a day's delay incident to the renewal of belts the remainder of the plant has been running as usual. Already a complete new equipment of improved machine tools is nearly installed in other buildings. As the Sturtevant Co. employs electric transmission for the driving of a considerable portion of its tools this work of installation has been a comparatively simple matter. Further delay in shipment of engine and electrical work is unlikely for no patterns or drawings were destroyed and the foundry with a large stock of castings is intact.

Air Moistening Apparatus.

The following mills have adopted the American Moistening Co.'s system of humidifiers: Orswell Mills, Fitchburg, Mass.; The Argo Mills Co., Gloucester, N. J.; Seneca Cotton Mills, Seneca, S. C.; Premier Cotton Mills, Helena, Ark.

This Company has recently received orders for humidifiers from the Swift Mfg. Co., Columbus, Ga.; The Revolution Cotton Mills, Greensboro, N. C.; and they have just completed the installation of humidifiers for the Springfield Worsted Mills, Bordentown, N. J., and are shipping two of their Aerophor Fabric Dampeners to Messrs. Joseph Bancroft & Sons Co., Wilmington, Del.

Recent Orders.

The Howard and Bullough American Machine Co. report the following orders recently received by them:—The Yazoo Cotton Mills, Yazoo City, Miss.; the entire equipment of machinery including picking machinery, revolving flat cards, electric stop motion drawing frames, slubbing, intermediate, roving and jack frames, spinning frames and twisters, all of the latest pattern. The stop motion drum spoolers will be supplied by Messrs. C. E. Riley & Co., Boston, Mass. The reels and single rail spoolers by the Draper Co., Hopedale, Mass. The product of this mill will be 40's to 50's, mostly two-ply.

The Granite Mills, Fall River, Mass., have placed a large repeat order for electric stop motion drawing frames with the Howard & Bullough American Machine Co., for No. 2 Mill, and revolving flat cards for the No. 1 Mill.

The Star Thread Mills, Athens, Ga.; a repeat order for twisters.

Geo. W. Chapin.

The firm of Fleming & Chapin, 229 and 231 Church St., Philadelphia, manufacturers' agents for lace edgings, braids, yarns and threads, has been succeeded by George W. Chapin, who continues the business in the same lines as before.

New Equipment.

Messrs. Schwartz and McKerrow report that they have recently received the following orders. The Fletcher's Manufacturers Co., Providence, R. I., Monfort Combing Machines; Canadian Colored Cotton Mills Co., Milltown, N. B., four intermediate and one finisher lapper made by Lord Bros., Todmorden, England. The Monfort combers ordered by the American Yarn Manufacturers Co., are now being installed.

MILL NEWS.

Cotton.

New Mills.

—*Alabama, Athens. The Athens Cotton Mill stockholders have decided to bond the mill for $25,000, in order to finish paying for the plant and secure money with which to operate same.

—*Alabama, Roanoke. The W. A. Handley Manufacturing Company expects to have the plant ready to start operations in September. This mill will have an equipment of 5000 spindles.

—Alabama, Stevenson. It is reported that the necessary subscriptions have been secured for erection of a cotton mill here, for which site has been donated. S. S. Broadus' name is mentioned in connection with the same.

—*Alabama, Talladega. The Chinnabee Cotton Mills are making rapid progress on erection of the mill buildings. The contract for machinery equipment has been let to the Howard & Bullough American Machine Co., which expects that the plant will be ready at an early date for installation of same.

—*Georgia, LaGrange. The main building of the Unity Cotton Mills is about ready for installation of the machinery. This building is 76x216 feet, 2 stories high.

—*Maryland, Ellicott City. The Patapsco Electric and Manufacturing Company, recently incorporated with capital stock of $100,000, with Geo. W. Harris, president, and Victor G. Bloede, Baltimore, treasurer, informs us that they have secured the "Grays Mill" property and will use the present buildings, for dyeing, bleaching and finishing works. They have not yet fully decided just what will be manufactured, nor details of equipment.

—*Massachusetts, New Bedford. Plans have been filed for the new plant of the Soule Mills Corporation. The main building, which will be the spinning mill, will be four stories high; the office building, 40 by 40 feet, one story high; the weave shed, 352 by 221 feet, one 15 foot story high with saw tooth glass roof and power house, one story high. Another building for cotton storage, plans for which have not yet been completed, will be erected. Work has been started upon construction and will be pushed to completion as rapidly as possible.

—*Mississippi, Kosciusko. The Kosciusko Cotton Mills, which were erroneously reported as having begun operations, will be ready to start manufacturing in September, although a trial run will be made in August. This is due to the scarcity of cotton, and directors deem it best to wait until fall before making a start.

—*Mississippi, Yazoo City. The contract for entire equipment of the Yazoo Cotton Mills has been let to the Howard & Bullough American Machine Co., of Pawtucket, R. I. This mill will manufacture 40s to 50s, mostly two ply, yarns.

—Missouri, St. Louis. Plans and specifications have been prepared for the erection of a large plant to manufacture cotton batting, twines and possibly cotton goods. Henry A. Diamant, president of the St. Louis Commission Company, is interested in locating the new enterprise at this place. All new machinery will be installed in the plant.

—New Jersey, Camden. The Hoffman Manufacturing Company has been incorporated with capital stock of $50,000 by John G. Hoffman, Joseph L. Dailey and Frank R. Daenhower. They will manufacture cottons, braids, tapes, etc. Main office will be at 320 Market Street.

—New York, Newburgh. A recent report states that George E. Lackey, formerly of Philadelphia, has purchased the Chadborn & Coldwell property and will start at once repairing same preparatory to installing machinery for manufacturing laces.

—*North Carolina, Durham. The Golden Manufacturing Co. has completed construction of buildings and machinery, consisting of 15,000 spindles and 400 looms, is being installed. This concern will make sheetings and tobacco bags.

—*North Carolina, Lumberton. The machinery is being installed in the Lumberton Cotton Mills and the plant will be ready to start production of goods next month.

—*Pennsylvania, Pittston. The Franklin Mills have been incorporated with a capital stock of $50,000, with Edward Rutledge, president; W. H. Rutledge, secretary and treasurer, and M. Mellon, general manager. This is a new plant, which was started in the latter part of 1900, at which time full data was given.

—*South Carolina, Newberry. The new company being organized at this place with capital stock of $200,000, an . in which E. B. Wilbur, M. A. Carlisle. C. C. Davis and others are interested, will manufacture a special grade of cloth not now made in the South. They propose having the mill equipped with 10,000 spindles.

—South Carolina, Spartanburg. The Arkwright Mills are increasing the number of spindles from 11,000 to 23,000.

—*South Carolina, Union. Progress is being made on erection and equipment of the Buffalo Cotton Mills, capitalized at $600,000. Concern will manufacture sheetings and will operate 33,000 spindles.

—*Tennessee, Humboldt. The Humboldt Cotton Mills, capitalized at $100,000, H. C. Burnett, president; R. Beare, secretary and A. R. Dodson, treasurer, inform us that the plant will be com-

pleted in a few weeks, and will start up for steady operations June 1st, making 4-yd. sheetings, 56 by 60.

—*Texas, Celeste. The contract has been awarded for erection of the Celeste Cotton Mills, superstructure of which must be completed by August 1st, in order to start operations about September, as previously reported.

—*Texas, Dallas. J. E. Wiley, founder of the New Century Cotton Mills, recently incorporated, has contracted for cotton machinery (Saco & Pettee) of equipment of 2500 spindles, including steam power, lighting and heating. The company will be capitalized at $40,000, nearly all of which has been subscribed. An engine room, boiler house, store house and a spur track from the Houston, Texas and Central Railroad will be built this spring and operations will begin some time in the fall. This is to be operated by negro help. The capital is quite largely subscribed in Boston.

—*Texas, Gonzales. At a recent meeting of the directors of the Gonzales Cotton Mills (under construction), the present officers were re-elected. A committee will be sent to Charlotte, N. C., to receive bids for the machinery equipment of the plant.

—*Virginia, Roanoke. It is proposed to have the Roanoke Cotton Mills in operation July 1st.

Enlargements and Improvements.

—*Alabama, Birmingham. Work has been started on erection of additional buildings for the Avondale Mills. The cloth room, warehouse and machine shop will be completed at once.

—Georgia, Macon. The Exchange Cotton Manufacturing Co. has petitioned for right of increasing the capital stock by $10,000.

—Georgia, West Point. The Langley Manufacturing Company, which is a comparatively new plant, will increase the capital stock to $100,000 and make extensive enlargements and improvement to the plant. Lap robes, fancy towels, portierres and Mitcheline quilts are made.

—*Georgia, West Point. The Langley Manufacturing Company, which recently increased the capital stock to $100,000 will increase the number of looms which have been ordered (Jacquard), to thirty. E. Lang is general manager and president of the company; S. T. Whitaker, vice-president; I. M. Scott, treasurer, and Edgar Mitchell, superintendent.

—Massachusetts, Boston. The Boston Thread & Twine Co., whose mill is at Jamaica Plain, is building an annex to the same.

—Massachusetts, Lowell. The large addition to No. 6 mill of the Appleton Mills, is nearing completion. Work has recently begun on erection of a new building, 170 by 50 feet, 2 stories high, to be used for a dye house. They will also build another story to No. 4 mill, used for weaving and slashing. It is expected to have the additions completed by July 1st.

—Massachusetts, West Warren. The Thorndike Company, operating the Warren Cotton Mills, contemplates increasing the number of spindles to 100,000 and installing combers. They will start at once on erection of additional building.

—New York, New York. F. C. Barton, 54 and 56 Franklin Street, manufacturing narrow fabrics, ribbons, spool tapes, braids, bindings, corset lacings, etc., has recently installed additional looms for making wide tapes and webbing for the trade.

—New York, Utica. The Skenandoa Cotton Mills are to install several new combing frames in the mill.

—North Carolina, Gibsonville. New machinery is being installed in the Minneola Mfg. Co.'s mills.

—North Carolina, Roanoke Rapids. The Roanoke Mills Co. have recently completed an addition to the plant, 100 by 100 feet, in which they have installed 50 new looms.

—*North Carolina, Statesville. Work has been started on construction of the additional building for the Statesville Cotton Mills.

—Pennsylvania, Wilkesbarre. The Wyoming Valley Lace Mills will erect a new 5-story fire-proof building for use as a warehouse. Another story will be built to the building recently completed, in which a lot of new machinery will be installed.

—*South Carolina, Anderson. The Cox Manufacturing Company has increased the capital stock from $50,000 to $100,000. Contracts will be awarded at once for erection of addition and machinery, in order to double the capacity of the plant.

—South Carolina, Bamberg. The Bamberg Cotton Mills have voted to increase the capital stock by $10,000.

—South Carolina, Bennettsville. A meeting will be held by the Bennettsville Manufacturing Company directors, to consider project of increasing the capital stock by $50,000. This is undoubtedly for purpose of making enlargements and improvements to the plant.

—*South Carolina, Cateechee. The Norris Cotton Mills will expend about $90,000 on additional machinery and developing the water power, converting it into electrical power, to be transmitted to the mill.

—*South Carolina, Clifton. The Clifton Manufacturing Company has completed installation of 15,000 additional spindles and 504 looms in the large annex recently completed.

—South Carolina, McColl. The stockholders of the McColl Manufacturing Co. making knitting yarns, are considering project of increasing the capital stock of the concern, $50,900 more for purpose of erecting a knitting mill.

—South Carolina, Winnsboro. The Fairfield Cotton Mills have been closed until about the first of June, for purpose of installing new machinery in addition recently contemplated.

—*Michigan, Vassar. Operations have been resumed in the Vassar Woolen Mills, Balbian Bros., proprietors.

—*Pennsylvania, New Cumberland. The Susquehanna Woolen Co.'s plant has again started running, having been recently shut down for the purpose of making repairs.

—*Tennessee, Knoxville. Operations have been resumed on full time in the Knoxville Woolen Mills, which have been shut down.

—*Virginia, Winchester. Operations have been started in the Virginia Woolen Mills.

Mills Shutting Down.

—Connecticut, Montville. The Montville Woolen Company has shut down the mill indefinitely.

—Massachusetts, Clinton. It is reported that the Sterling Worsted Co.'s mill, which has been shut down indefinitely, will be started up under new management.

—Massachusetts, Holyoke. A recent report states that Connor Bros. have closed their mills for an indefinite period.

—Massachusetts, Pittsfield. S. N. & C. Russell Manufacturing Co.'s plant has been shut down for purpose of making necessary repairs.

—New Jersey, Trenton. Owing to the poor condition of the market, the No. 2 mill of the John Williams Manuacfturing Co. has been shut down.

—Pennsylvania, Chester. The Esrey Manufacturing Co.'s No. 2 mill has been shut down on account of destrution of engine in that plant, caused by breaking of the crank shaft. An entire new engine will be built. Damage estimated at about $4000.

Knit.

New Mills.

—*Alabama, Anniston. The Anniston Knitting Mill, capitalized at $25,000, Alfred L. Tyler, Jr., president and treasurer and Wilson Weekly, superintendent, started operations May 20th, making children's and misses' ribbed hosiery, with 25 knitting machines. They propose installing a dye plant later on.

—*Georgia, LaFayette. Contract has been let for the erection of the Elizabeth Hosiery Mills. A. N. Steele is president and W. H. Steele, secretary and treasurer of the company, which expect to be ready to start production of goods in September. The building will be 50 by 170 feet, two stories.

—*Mississippi, Columbus. J. B. Bell is president and V. D. Molloy, secretary of the Columbus Hosiery Mills, recently incorporated. They are now making investigations of knitting mills and upon reaching decision will start at once on building. It expected to have the plant ready for operation by fall.

—*Mississippi, Laurel. Arrangements have been completed whereby work can proceed on erection of the Laurel Knitting Mills and work will be pushed to completion as rapidly as possible. They will make hosiery and expect to have the plant ready for production of goods in a few months.

—New Jersey, Jersey City. The Pottstown Hosiery Mills, 30 Virginia Ave., have been incorporated by H. C. Balcom, A. R. Wood and R. L. Smith to manufacture hosiery.

—*New York, Kinderhook. The new mill recently started here by Imond Vener and Isaac Metstein, is the Columbia Knitting Mill Co. They make gloves, mittens, sweaters, leggins, toques, and hosiery, operating 20 knitting machines.

—New York, Utica. The Argo Knitting Company is a new concern which will shortly start operations here making hosiery. It will be located on Charlotte St. below Bleeker. B. T. Steber, who has lately patented a device for new knitting machine, is largely interested. Eighteen machines will be installed to start making children's hosiery.

—New York, Watertown. A small stocking factory will be started here by Oscar Doney.

—*North Carolina, Shelby. Work has been started on construction of the $10,000 knitting mill here. Operations will be started as soon as possible.

—*North Carolina, Valdese. The Waldensian Hosiery Mill, established here by J. & F. Garron and A. Grill, started operation on the 1st, making misses' and ladies' hosiery and men's half hose. The mill has an equipment of 20 knitting machines.

—*New York, Little Falls. The new hosiery mill to be established here by Everett Mack and others will be for manufacture of fine hosiery. They will have an equipment of 8 knitting machines, using electric power. They are in the market for various parts of the equipment necessary for such a plant.

—*Pennsylvania, Palmyra. The Palmyra Hosiery Mill will be put in operation in about 60 days, by S. F. Engle and Jno. A. Balsbaugh. They will make 160 needle men's half hose, operating 12 knitting machines.

—*Pennsylvania, Reading. The report concerning establishment of a new hosiery mill on Lemon Street, should have read newly started up by H. C. Shantz and not by W. M. Shantz, as stated.

—Pennsylvania, Reading. The Hawk Knitting Company has been incorporated with capital stock of $15,000 by Geo. W. and Nathan Hawk, W. H., L. W. and W. D. Kehl, succeeding Geo. W. Hawk, manufacturing seamless half hose.

—Pennsylvania, Reading. Contract has been let to Ubil & Ehman for the erection of a new building in which a hosiery plant will be established. William Essick is owner of the property.

—*Pennsylvania, Shippensburg. The Shippensburg Knitting Mill has started operations with about 30 employees, this number to be increased later.

—*South Carolina, Landrum. The land has been surveyed for location of the new mill by the Blue Ridge Hosiery Mill Co. and work started on manufacturing the necessary brick.

—South Carolina, Whitmires. Charles Tidmarsh is contemplating organizing a knitting mill at this place; capital stock about $15,000, and is desirous of obtaining information on the subject. He has not yet decided what class of goods to be made, and would like estimates on outfits that promise the best results.

—Virginia, Berkley. The Leroy Manufacturing Company has been incorporated with capital stock of $25,000, for purpose of making shirts and hosiery.

—*Wisconsin, Depere. C. W. Jackson is president, A. D. Race, secretary and treasurer and Jos. Branson, superintendent of the Onedia Knitting Company, recently incorporated with capital stock of $25,000. They will manufacture shawls, skirts, fascinators, etc., operating 5 or 6 knitting machines, using water power. Expect to begin running about June 20th or July 1st.

Enlargements and Improvements.

—Connecticut, Danielson. The Uncas Knitting Company has increased the capital stock from $30,000 to $100,000.

—*Georgia, Athens. The Standard Manufacturing Co. has started removing its plant to new quarters: viz., the old Piedmont Spool & Bobbin Co.'s buildings, which have been repaired and also new buildings erected. The capacity of the plant will be greatly increased.

—Georgia, Tifton. The Tifton Knitting Mills contemplate increasing the capital stock to $15,000. They will purchase 25 additional knitting machines and add a dyeing plant to the equipment.

—Iowa, Des Moines. The Iowa Knitting Company which we previously reported had increased its capital stock for purpose of making enlargements and improvements to the plant, will add about sixty new machines. They also contemplate enlarging and improving the dye house.

—Michigan, Lexington. The Lexington Woolen Mills, John L. Fead, proprietor, have been enlarged, and 10 new full automatic knitting machines for making seamless ladies' and boys' hosiery, have been installed. Hand and machine knit mitts have also been added.

—*Michigan, Three Rivers. The Quincy Knitting Co., which we previously reported under Quincy, Mich., to remove their plant here, are established in temporary quarters, but are negotiating for an unoccupied factory building. The company has been reorganized with a capital stock of $15,000; W. E. Clark, president; F. H. Case, treasurer; W. H. A. Godfrey, superintendent and George H. Cornell, assistant superintendent. They have at present 24 looms and will add 8, giving plant total of 32, makink knit goods, gloves, mittens, toques, leggins, etc.

—New York, St. Johnsville. The Royal Knitting Mills are to increase the capital stock from $25,000 to $50,000.

—Pennsylvania, Pottstown. The Pottstown Knitting Company has leased an additional building for manufacturing purposes.

—South Carolina, Blacksburg. A meeting will be held May 27th by the stockholders of the Blacksburg Spinning & Knitting Mill, to consider increasing the capital stock from $15,000 to $25,000.

—Pennsylvania, Philadelphia. Brown & Hunt, formerly located on Fox Street, have removed their hosiery manufactory to 6th floor of the new Philadelphia Tapestry Mills, on Allepheny Avenue, between Front and 2d Streets.

—*Wisconsin, Ripon. The Ripon Underwear Company, whose plant was recently burned, has decided to resume operations as soon as possible and will start work on rebuilding.

Mills Starting Up.

—*Georgia, Cedartown. The Josephine Mills have started production of fine grade of underwear.

—New York, Phoenix Mills. Operations have been resumed in the Index Knitting Mills, nearly the full force being employed.

Mills Shutting Down.

—New York, Schenectady. The Alpha Knitting Company's mill has been shut down indefinitely.

Silk.

New Mills.

—*Connecticut, Willimantic. A number of the looms have been set up in the building leased by the Windham Silk Company and operations will be started up shortly.

—*New Jersey, Hoboken. The Roside Fabric Company, incorporated with capital stock of $30,000 and Max Meyenberg, president; Albert Kuenstler, treasurer and Chas. Laubsch, superintendent, started manufacturing silks of light weight and texture, April 20th. The mill is located at Hillsdale, and was previously reported by us under Chas. Laubsch's name. They operate 40 looms, using steam power.

—*New Jersey, Paterson. The Spring Silk Company, recently incorporated, and of which David Matchett is president and superintendent; Richard Matchett, treasurer and Harry Freeland, selling agent, manufactures broad silks and taffetas. Plant, which is located in the Essex Mill, is equipped with 17 looms.

—New Jersey, Paterson. The American Shawl Company has been incorporated with capital of $5000 for purpose of manufacturing silk and cotton goods and shawls. Cyrus W. Baldwin and William O. Mickel, are interested.

—*New Jersey, Paterson. A late report from Symington & Isaac, 15 Broadway, concerning their new mill, states that they operate 22 looms on taffetas and peau de soi silks. They use electric power and sell goods direct.

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—*New Jersey, Paterson. It is reported that the F. H. Mayhew, who has removed his throwing mill at Wortendyke to Altoona, Pa., recently, will remove the looms to the Barnert Mill, where he has leased space.

—*New Jersey, Paterson. Robert Love, located in the Broomhead Mill, making novelty grenadines, operates 10 looms.

—*New Jersey, Paterson. Siegfried Butz, whom we previously reported had started a plant in the Adams Mill, informs us that he is located in the Harmony Mill, and operates 26 looms, making dress and tie silks.

—*New Jersey, Paterson. The Hawthorne Silk Company, incorporated with capital stock of $100,000, with J. J. Bailey, president and D. Ashley, Jr., treasurer, expects to have the plant, located at Hawthorne, in operation by November, 1901. They will make cotton and mixed goods.

—New York, Schenectady. Woodhouse, Bopp & Co., New York City, manufacturers of dress silks, are considering inducements to establish a branch mill and have written to the Board of Trade, of which Charles F. Veeder is president, for bonus, etc.

—*Pennsylvania, Altoona. The Juniata Throwing Company previously reported incorporated at Paterson, N. J., with capital stock of $50,000, is for purpose of operating F. H. Mayhew's plant at this place and not at Wortendyke as stated.

—*Pennsylvania, Duryea. F. J. Regan, Sol. Hirsch and Jos. B. Gilboy are interested in the new mill projected at this place, but for which arrangements have not yet all been completed. They propose making silk thread, etc.

—*Pennsylvania, Hollidaysburg. The Hollidaysburg Hosiery Factory has been leased by Schwarzenbach, Huber & Co., and will be converted into a silk mill.

—*Rhode Island, Cumberland. The Naushon Company, reported incorporated at Jersey City, N. J., will establish a mill here for weaving silk, cotton and linen, and has been granted exemption from taxation for a period of ten years. The new plant will be 60 by 100 feet, two stories and weave shed, 160 feet square. It is stated that M. G. Chase, of Woonsocket, is the president of the concern.

—Rhode Island, Hope Valley. It is reported that William W. Wiley has leased the Moscow Mill, formerly operated by A. A. Crandall, and will install silk machinery, not under attachment in the silk mill at Wyoming.

Enlargements and Improvements.

—Pennsylvania, Allentown. Contract has been let for the erection of additions to the Pioneer and Givernaud Silk Mills. A building 37 by 48 feet, two stories high, will be built to the Pioneer Mill, and one 60 feet square, one story high, will be erected for the Givernaud Silk Mills.

—Pennsylvania, Bethlehem. Plans are under way for the erection of an addition, 50 by 90 feet, to Fichter & Martin's Silk Mill.

—Pennsylvania, Philadelphia. A large building, 50 by 200 feet, 5 stories high, will be erected for the Orinoko Mills, manufacturing upholstery goods.

Mills Starting Up.

—*New York, Delhi. Work has been started up in the Delhi Silk Mill.

—*New York, Watertown. The Ellwood Silk Mill has been purchased by the Valentine & Bentley Silk Company, of Newton, N. J., and Pittston, Pa. It is expected that the mill will be put in operation in about a week.

—*Pennsylvania, New Holland. Operations have been resumed in the New Holland Silk Mill, recently secured by Hardt, Von Bernuth & Co. James A. Gilfillan, of Paterson, N. J., is now superintendent of the plant.

Mills Shutting Down.

—Pennsylvania, Hallstead. The Hallstead Silk Mill has been shut down indefinitely.

Miscellaneous.

New Mills.

—*New Jersey, Athenia. J. Thorp is treasurer, agent and superintendent of the Eureka Printing Co., recently incorporated with capital stock of $40,000. The plant is operated by steam, printing calicoes.

—*Rhode Island, Rockland. W. E. Joslin is president; Edwin A. Smith, treasurer, and John D. Turner, agent and superintendent of the Clayville Co., incorporated with capital of $50,000, to bleach, dye and finish yarns, warps, braids, etc.

Enlargements and Improvements.

—Maryland, Cumberland. An addition, costing about $3000, will be built to T. Footer & Son's dye works.

—New York, Nyack. The Peerless Dyeing, Printing & Finishing Co. has recently purchased the Sexsmith factory and are remodelling same for their own use. They will also erect an additional building, 40 by 100 feet. The old plant will be retained for the dyeing department, but the printing and finishing will be done in new additions. Machinery will be gradually removed to new additions, which they contemplate having ready for operation by September.

—Rhode Island, Pawtucket. An addition, 98 by 50 feet, brick, one story high, is to be built to the Dempsey Bleachery & Dye Works.

Mills Shutting Down.

—North Carolina, Wilmington. The American Chemical & Textile Coloring Co., of which H. M. Chase is manager, has shut down the plant for a week or two, upon recent movement taken by the cotton mills to curtail their product.

Fires.

—Connecticut, Jewett City. The Ashland Cotton Company's property was struck by lightning recently. The loss is covered by insurance.

—Connecticut, Pine Meadow. D. B Smith & Son's cotton duck mill was damaged by fire.

—Georgia, Augusta. The Globe Cotton Mills were nearly totally destroyed by fire. The loss, which is estimated at $45,000, is covered by insurance of $35,000. Plant will be rebuilt.

—Maryland, Hagerstown. The silk mill of Collinge & Nolan Co., also operating a plant at Paterson, N. J., was totally destroyed by fire. The loss is estimated at about $60,000.

—Massachusetts, Taunton. The Taunton Dye Works and Bleachery Co.'s plant was burned April 30. Loss is estimated at about $27,000, covered by insurance.

—New Hampshire, Hookset. The largest of the Hookset Manufacturing Co.'s storehouses has been destroyed by fire. Loss is estimated at $90,000, fully covered by insurance.

—New Jersey, Clifton. The Barclay Silk Mill was destroyed by fire recently. The store room, located in the front part of the building, containing finished goods valued at about $5000, was also a loss. There was some insurance on the building, but not enough to cover losses.

—Pennsylvania, Bell's Landing. James Pontefract & Co.'s mill was destroyed by fire recently. Loss is estimated at $11,000.

—Pennsylvania, Philadelphia. The large office building occupied by Chas. J. Webb, at 116 Chestnut Street, was destroyed by fire. The building was used mainly for storage of cotton yarn and upon this is based a loss of about $25,000.

—Pennsylvania, Philadelphia. James Martin & Co.'s dye works, located at Richmond and Tioga Sts., were damaged by fire recently. Loss is estimated at about $2000.

—Pennsylvania, Reading. The Prospect Dye Works, with which Otto Reissman and Max Thus are interested, have been completely destroyed by fire. Loss is estimated at about $25,000, covered by insurance.

—Rhode Island, Bristol. The mill of the Bristol Wool Company, a concern organized last February, has been destroyed by fire. This plant was originally built and equipped by the American Textile Manufacturing Co., for carbonizing rags and weaving curtains, but later purchased by Arthur O'Leary of Providence and subsequently the Bristol Wool Company was formed to carry on the business.

—Vermont, Brattleboro. The hosiery mill, operated by Chas. Miner has been destroyed by fire. A large house and two barns were also lost. Damage, estimated at about $20,000, is covered by insurance of $12,000.

Facts and Gossip.

—California, San Diego. H. P. Wood, secretary of the San Diego Chamber of Commerce, writes us that they have heard nothing definite regarding Mr. Magid's project of establishing a spun silk mill here, although the locality has been looked upon as favorable for such an enterprise.

—Connecticut, Sterling. The stock and plant of the Sterling, Dyeing & Finishing Co. has been transferred to The United States Finishing Co. The Sterling Company, organized as a corporation, will be kept distinct, although the officers will be same as those of the U. S. Finishing Co.

—Connecticut, Thompsonville. It is reported that Lyman A. Upson is interested in starting up a new company for manufacturing axminster carpets, for which a new patent loom attachment has been secured by him. It is not known just where the project, which is still in embryo, is to be located. The Board of Trade at Indian Orchard, Mass., is making efforts to secure it at this place.

—Georgia, Dalton. Dr. T. C. Smith and associates are interested in erecting a hosiery mill here.

—Georgia, Maysville. G. E. Deidweiler and associates are interested in erecting a knitting mill at this place.

—Iowa, Montrose. It is reported that a silk factory will be located here.

—Kansas, Topeka. It is reported that another woolen mill will be established here by company in which J. F. McAfee is said to be interested.

—Kentucky, Paducah. Work is now under way on rebuilding the Alden Knitting Mills, recently destroyed by fire, and upon which the insurance has been adjusted.

—Louisiana, Nacogdoches. E. A. Blount informs us that the report concerning the project of establishing a cotton mill here is erroneous.

—Maine, Freedom. It is reported that the Freedom Mills, formerly operated by A. A. Thompson, have been sold and are to be enlarged by the new owner.

—Maryland, Hagerstown. It is reported that if the old silk mill destroyed by fire is not rebuilt, a new one will be erected by others interested.

—Massachusetts, Chicopee. About one-half of the machinery in the Chicopee Mfg. Co.'s Mills will be stopped until further notice. This has been caused by the loss of foreign trade.

—Massachusetts, Lowell. The Thorndike Manufacturing Co.'s plant has been purchased by Josiah Harriman, at a private sale. This concern makes elastic webbing and braids.

—Massachusetts, Mansfield. David Smiley & Co., manufacturers of shoddy, are moving into the new buildings recently purchased, where facilities will be largely increased.

—*Massachusetts, Milford. The Magid-Hope Silk Manufacturing Co., which was previously reported as reorganized under a new name, has gone into liquidation.

—*Massachusetts, Newton. The property of the Nonantum Worsted Co., recently reported purchased by W. A. Webster, has been deeded to Charles A. Vaille, President of the Nat. Bank of the Republic. It is reported that the plant will be sold as a whole or piecemeal as opportunity offers.

—Massachusetts, Pittsfield. The W. E. Tillotson Manufacturing Co. has been incorporated with capital stock of $175,000; William E. Tillotson, president and William L. Searles, treasurer. This corporation will operate plant of W. E. Tillotson.

—Michigan, Midlands. It is reported that Henry S. Fooper has leased a factory building here and will manufacture underwear.

—Minnesota, Portage. It is reported that a knittting mill is projected at this place.

—Montana, Billings. It is reported that William Whitfield, interested in the new woolen mill at Big Timber, removed from Lanark, Ill., contemplates erecting another mill at this place.

—New Hampshire, Hookset. The Hookset Mills are to be reorganized on account of serious illness of Harry D. Bourne, present treasurer and manager, who is unable to attend to the business. They will make a new line of goods, suited for the present market.

—New Jersey, Hackettstown. The Board of Trade is considering a proposition made by the Ashley & Shaw Silk Co. to establish a weaving mill here in connection with the throwing mill now in operation.

—New Jersey, Newfield. The Newfield Rug Company has now been incorporated with capital stock of $100,000, by James C. Morrow, John O'Neil and Moses Krauss. Plant manufactures Smyrna rugs and carpets.

—New Jersey, Paterson. The Orion Mfg. Co. has been incorporated with capital stock of $100,000 by Frederick Haigh, Antony B. Hopper and John K. Greenwood. They will treat yacht cloth, dress goods and similar fabrics by a special process in which the goods will be made unshrinkable.

—New Jersey, Williamstown. It is reported that a rug factory will be established near here, for which land has already been purchased.

—New York, Cohoes. The Capital City Knitting Company has been incorporated with capital stock of $15,000 for manufacturing knit goods. S. E. Clifton, M. P. Clifton, Richard Bolton, M. C. Rowe and John S. Cronin are mentioned as the directors. This Capital City Mills has been operated by S. E. Clifton & Co.

—*New York, Frankfort. The property of the Frankfort Linen Mfg. Co. will be sold by the receiver, June 14th.

—New York, Hudson. The Beaver Knitting Mill, which was moved here from Little Falls by John McCauley, has been incorporated as the Hudson Knitting Mill, with a capital stock of $100,000. F. H. McCormick is president; John W. Carlup, treasurer, and John McCauley, buyer. They manufacture sweaters, ladies' ribbed underwear and overshirts. The mill is equipped with nine sets and 70 knitting machines. Product is sold direct.

—New York, Newburg. At a recent meeting of the stockholders of the Newburgh Bleachery, Joseph Chadwick was elected president to succeed to the vacancy made by death of Jas. Chadwick, Walter M. Smith, vice president, and Thomas F. Chadwick, secretary and treasurer.

—*New York, Newport. The capital stock, $30,000, of the Newport Knitting Co. has all been paid in. The details of this mill have been reported previously.

—New York, New York. The Novelty Woolen Company has been incorporated by Julius Stein, William R. Flinnegan and E. H. Norton.

—New York, New York. The Rickerson-Collins Company has been incorporated with capital stock of $100,000; C. L. Rickerson, president and J. Ross Collins, treasurer. They will operate the plant formerly known as the Collins Jute Mills.

—New York, New York. The United States Cotton Duck Corporation will be organized with capital stock of $25,000,000 preferred and $25,000,000 common stock. Arrangements have been completed for merging the Mt. Vernon Woodberry Cotton Duck Co., which previously acquired some fourteen mills, The Columbia Mills, Columbia, S .C., The Stark Mills, Manchester, N. H., the Lagrange Mills, Lagrange, Ga., and the Hogansville Manufacturing Co., Hogansville, Ga. The company also has the option right to purchase the West Point Manufacturing Co. and other corporations in Geogia.

—New York, Waterloo. The Waterloo Woolen Mfg. Co. has resumed night work at the mill.

—North Carolina, Elizabeth City. A project is on foot for erecting a silk mill here with a capital stock of $50,000.

—North Carolina, Harrisburg. Site has been donated by the Harrisburg Improvement Co. for a cotton mill, of which M. H. Caldwell is the promoter.

—North Carolina, Scotland Neck. Mr. E. Shields has sold his interest in the S. & J. Hosiery Mills, to E. Jenkins (partner) and J. E. Woodard. This mill, which has not been in operation a year, has a capacity of 120 dozen per day.

—North Carolina, Raleigh. The Palmetto Manufacturing Co. has been chartered with capital stock of $25,000 to manufacture cotton and other goods. John P. Cameron, John M. Smith (Rockingham) and James M. Dockery (Hamlet) are interested.

—*North Carolina, Smithfield. We have been advised by the Smithfield Cotton Mills that they desire to rent the lower floor of their mill to some concern which will use the product of their plant, viz: 20s to 26s hosiery yarns, but do not intend to manufacture knit goods themselves.

—North Carolina, Spray. The American Warehouse Co. is capitalized at $200,000 and has been in operation since January. F. L. Fuller is president and F. M. Ellett, Jr., secretary. Included in the equipment are 12 large napping machines and the mill finishes various kinds of cotton piece goods.

—North Carolina, Windsor. It is reported that J. H. White is interested in erection of a hosiery mill here with capacity of 200 dozen pairs per day.

—*Ohio, Piqua. Efforts are being made by the stockholders of the F. Gray Company to reorganize in order to prevent sacrifice of property in order to pay the liabilities.

—Oregon, Astoria. A project is now on foot for locating a woolen mill at this place. G. W. Herst, who is interested in a plant in Iowa, is mentioned in connection with the new project.

—Oregon. The Dalles. It is reported that efforts are being made to establish a mill here to manufacture woolen goods, a proposition to purchase a mill located in Wisconsin being under consideration.

—*Pennsylvania, Allentown. It is now stated that Givernaud Bros. are in no way connected with purchase of the Pioneer Silk Mill at this place. The new company comprises M. W. Fleitmann, E. Garli and C. Piva.

—*Pennsylvania, Allentown. W. C. Urner & Co. advise us that report regarding removal of the branch mill here to Spring City, is correct and that they will locate elsewhere as soon as business warrants their doing so. Inability to secure competent help was cause of removal.

—Pennsylvania, Bloomsburg. The Magee Carpet Works have sold the ingrain department to Charles H. Wells, of Scranton, Pa.

—Pennsylvania, Chester. At the annual meeting recently held by the stockholders of the Jordan Manufacturing Co., which is an incorporation of the Jordan Mfg. Co., and the Arasapha Mfg. Co., William S. Blakeley was elected president; Richard Wetherill, vice-president; Irving W. Jordan, secretary and treasurer and Robert F. Kineavy, superintendent.

—*Pennsylvania, East Stroudsburg. C. B. Staples informs us that he purchased the Melrose Hosiery Mill for the bondholders secured by mortgage. There is no present prospect of the mill being started as the machinery is for sale.

—Pennsylvania, Lenni Mills. The worsted machinery purchased by the Philadelphia Worsted Co., from Daniel Lees, is being removed to company's plant at Camden, N. J.

—Pennsylvania, Philadelphia. H. W. Butterworth & Sons Co. are erecting an addition, 100 by 70 feet, one story, to their plant.

—Pennsylvania, Philadelphia. The Philadelphia Linen Finishing Works have been recently purchased by Messrs. Taylor & Scott, at a private sale.

—Pennsylvania, Philadelphia. The Simons & Struve Hosiery Company has been incorporated with capital stock of $25,000.

—Pennsylvania, Stroudsburg. The William A. Gilbert Company has been incorporated to operate the plant of William A. Gilbert & Co., Mr. George G. Tillotson, formerly connected with the firm, has retired.

—Pennsylvania, Wilkesbarre. Bamford Bros. Silk Manufacturing Co. are removing their plant back to Paterson, N. J., where mill was located previous to establishing it here.

—*Pennsylvania, Woolrich. The knitting and sewing departments of the woolen mills controlled by John Rich & Bros., are running. As soon as the loss is adjusted, work will be started in rebuilding the mill.

—*Rhode Island, Apponaug. The Oriental Print Works were bid in by Mr. O'Brien for the Eben D. Jordan Estate for $50,000. The mortgagees hold a mortgage for $125,000 on the plant. It is reported that operations will be resumed in the plant as soon as business warrants doing so.

—Rhode Island, Manville. The Manville Co., recently incorporated with capital stock of $6,000,000 is a consolidation of the Manville Co. with mills at Manville and the three mills of the Social Manufacturing Company at Woonsocket, R. I. Henry F. Lippitt, is agent and general manager of both concerns.

—Rhode Island, Woonsocket. Mark Hough, who has been renting the dye house of the American Worsted Company, has purchased the same.

—*Rhode Island, Woonsocket. Joseph Bouvier and Alphonse Gaulin, Sr., purchased all the real estate and steam and hot water plant of the American Worsted Co., at auction sale held on the 1st inst. The American Block, occupied by stores and printing offices was sold for $33,200, and the Stone Worsted Yarn Mill for $43,000. The machinery was sold in small lots. It is stated that the mill will be remodelled for stores.

—Rhode Island, Woonsocket. The Perseverance Worsted Co., which has previously sold its goods through commission houses, will now sell their goods direct, and have appointed Fred E. Warren selling agent, with headquarters in New York.

—*Rhode Island, Wyoming. The property of the Monopole Weaving Company was purchased at the sheriff's sale, by Russell Murray & Co., for $1,501.00. It is stated that the employees will be paid in full, the creditors receiving what remains. It is thought that the mill may be put in operation in a few weeks.

—*Rhode Island, Wyoming. The plant of the Monopole Weaving Co. will be sold at public auction, May 24th, Edward G. Cundall, sheriff. This property was attached at instigation of Maurice Warnier & Co.

—*South Carolina, McColl. The McColl Manufacturing Company has decided not to erect a knitting mill.

PERSONAL RECORD.

Cotton.

—Daniel J. Carey, of Pawtucket, R. I., has recently been engaged by W. C. Plunkett & Sons, Adams, Mass., as overseer of dyeing.

—William E. Andrews, of Chester, Pa., has been appointed general superintendent of the Delaware Cotton Co., whose mills are located in Wilmington, Del. He assumed his new duties on May 1st. Mr. Andrews was connected with the Arasapha Mills for a number of years, as head of one of the departments.

—Charles Buck, formerly of the Washington Mills, Lawrence, has been engaged to take charge of the ring spinning department at the Burlington Cotton Co.'s mills, Burlington, Vt.

—George H. Booth, formerly employed at Winooski, Vt., is now overseer of the mule spinning department at the Howland Mills, New Bedford, Mass.

—J. E. Buice, Union, S. C., is now boss spinner at the Gaffney Manufacturing Co.'s mills, Gaffney, S. C. He succeeds J. C. Clippard, resigned.

—J. F. Baulding, Burlington, N. C., has succeeded W. J. Wing as boss dyer at the Hucomuga Mills, Greensboro, N. C

—W. T. Brown is superintendent of the new Canton Cotton Mills, Canton, Ga.

—P. B. Cullom has resigned as boss spinner at the Lane Mill of New Orleans, La.

—Andrew J. Currier, Valley Falls, R. I., has retired from the dual position of agent and superintendent of the Valley Falls and Samoset Companies.

—D. B. Clark, master mechanic at the works of the Cocheco Manufacturing Co., Dover, N. H., has resigned, and F. A. Whitmore, formerly superintendent of the Draper Co., Hopedale, Mass., having direct charge of their extensive machine shops, has become his successor.

—J. T. Carter, boss carder and spinner at the Milfort Mills, Fort Mill, S. C., is now acting in a similar capacity for the Nokomis Cotton Mills, Lexington, N. C.

—C. C. Cuthbertson, recently secondhand of weaving at the Cannon Mill No. 3, Concord, N. C., has accepted the position of boss weaver at the Alpha Mills, Charlotte, N. C.

—Horace W. Davenport, who for the past thirty years has been connected with the Dunnell Print Works, Pawtucket, R. I., finished his duties with that concern (now the United States Finishing Co.) last month.

—A. L. Eastwood of Adams has succeeded W. E. Syles as boss spinner at the Attawaugan Co.'s mill, Killingly, Conn.

—J. C. Fenley, formerly at the Granby Mills, Columbia, S. C., is now boss weaver at the Saxon Mills, Spartansburg, S. C.

—Robert Fielden, overseer of the weaving department of the Border City Mill No. 2, Fall River, Mass., has retired from active work. Mr. Fielden has been employed in various Fall River mills since early in the '50's, and has for many years been overseer of weaving. Twenty years ago he accepted an overseer's position in the Border City No. 2 mill, where he has ever since remained. James Lee, formerly overseer at the Shove Mills, and more recently secondhand at the Border City Mill, will fill the position of overseer in that concern, to succeed Mr. Fielden.

—C. H. Goodroe has been engaged as superintendent of the new Gibson Mill, Concord, N. C.

—Early Grover, superintendent of the Chewalla Cotton Mills, Eufala, Ala., has sent in his resignation.

—Charles Hamnock, formerly of Lindale, Ga., is the new superintendent of the Ellawhite Mills, Uniontown, Ala.

—John Henry now has charge of the weaving, slashing and drawing in departments at the Danielsonville Cotton Mills, Danielson, Conn.

—F. J. Lennon has recently resigned as overseer of the dyeing department of the Eagle Mill, Woonsocket, R. I., and has assumed his new duties as boss dyer with the New York Mills, New York Mills, N. Y.

—Thomas F. Landers, overseer of the fancy and brown dyehouse at the Boston Duck Co., Bondsville, Mass., has resigned after 20 years' service with the company. He began work in the cotton mill at the age of 10 years. Shortly after the bleachery was built, he entered the fancy dyehouse, and was soon promoted to secondhand. After a year in Lowell, he returned and was promoted to foreman of the brown dyehouse, and three years later, was promoted to overseer of the brown and fancy dyehouse. Mr. Landers was for a short time overseer of the bleachery. William Landers, who took his brother's place when he was promoted to overseer, has also resigned, and Robert Landers, another brother, secondhand of the fancy dyehouse, has severed his connection with the company. L. F. Sullivan, overseer of the blue dyehouse, will take Mr. Landers' place as overseer of the brown and fancy dyehouse.

—James Martin, formerly overseer at the Clinton Mill, Woonsocket, R. I., has accepted a position in Reading.

—Miles McSweeney has resigned as foreman of the card room of the American Flax Co., Indian Orchard, Mass.

—Dennis McElroy, bleacher, has resigned his position after a 30 years' service with the Dunnell Manufacturing

Company and the United States Finishing Co., Pawtucket, R. I.

—J. E. Norris, until recently with the Massachusetts Mills, Lindale, Ga., is now loom fixer at the Fulton Bag & Cotton Mills, Atlanta, Ga.

—H. T. Poe has been engaged as superintendent of the Poe Manufacturing Co., Greenville, S. C.

—H. C. [illegible], the late assistant superintendent of the Merrimack Mills, Lowell, Mass., has been appointed superintendent of the Greylock Mills, North Adams, Mass. His many friends in Lowell wish him success in his new undertaking. The position was formerly held by A. B. Mole, who has acted as agent and superintendent.

—J. Parker, recently superintendent of the Glasgow Mills, South Hadley Falls, Mass., the various departments of which have now all been shut down, has accepted a position in Savannah, Ga., to manage a cotton mill.

—H. J. Smith, formerly superintendent of the Millville Cotton Mills, Millville, N. J., under Mr. Brainerd, has resigned that position to accept the place of overseer of spinning at the Cocheco Manufacturing Co.'s mills, Dover, N. H.

—F. Shuttleworth, secondhand in the Thorndike Company's mills, Palmer, Mass., has been promoted to overseer, to succeed J. Hutchinson.

—David Sims, formerly overseer in the Hargraves Mills, and later in the Acushnet lappet room, New Bedford, has assumed the position of overseer of the Whitman Mill weave shop, New Bedford, Mass.

—Hampden E. Tener, Jr., has been elected treasurer of the American Cotton Co., in place of Winthrop M. Tuttle, resigned. Mr. Tener until recently was connected with the Carnegie Steel Co., of Pittsburg, as an officer and partner.

Woolen.

—Robert Ambach has been promoted from loom fixer to boss weaver at the Riverdale Mills, Great Barrington, Mass.

—Willis N. Anthony, Gilbertville, Mass., has accepted a position as overseer of the weaving department at the Mayo Woolen Co., Millbury, Mass., on night force.

—E. T. Albertin, Newton, Mass., has taken the position of boss dyer at the Central Woolen Mills, Stafford Springs, Conn., formerly held by George M. Lawton.

—Thomas Allshaw, formerly of the Tremont & Suffolk Mills, Lowell, now has charge of the Danielsonville Cotton Mills, Danielson, Conn., recently purchased by the Cochrane Mfg. Co., Dedham.

—William Battye has secured the position of designer and assistant superintendent with the Mayo Woolen Co., Millbury, Mass., succeeding S. J. Hall. Mr. Battye was formerly designer for the Ashaway (R. I.) Woolen Co.

—J. Bennett, formerly of East Glastonbury, Conn., has recently engaged with the American Felt Co., Glenville, Conn., as boss spinner.

—James Bright, superintendent, has severed his connection with the Dunbarton Flax Spinning Co., Greenwich, N. Y., and has removed to Ireland, to engage in the manufacture of linen cloth. Samuel Brown has arrived from Belfast, Ireland, to take the position of superintendent left vacant by Mr. Bright.

—Thomas J. Boodel has resigned his position as dresser tender at the Saranac Worsted Mills, Blackstone, Mass., to take that of overseer of dressing, spooling and twisting at the mill operated by Sayles & Gilleran, Woonsocket, R. I.

—E. S. Creamer, formerly of Washington Mills, Lawrence, Mass., has accepted the position of superintendent and designer of the Hampden Mills Co., Hampden, Mass.

—Henri Duval has been appointed superintendent of the Nasonville Woolen Co., Nasonville, R. I.

—Hiram Dawson, formerly assistant superintendent of the mill of the New England Co., Rockville, Conn., has accepted a position as inspector of woolens in Stern Bros.' wholesale house, New York.

—Albert E. Davis has resigned as boss weaver with Amos Abbott & Co., Dexter, Me., where he has been the past six months. The help presented him with a meerschaum pipe as a token of respect and esteem in which he is held by them. Mr. Davis has hired the Ironston Woolen Mill, Uxbridge, Mass.

—Joseph A. Daly, formerly employed as overseer of carding for the Faulkner Woolen Co., Stafford Springs, Conn., is now engaged in that capacity by Beebe, Webber & Co., Holyoke, Mass.

—J. Allen Fitts has severed his connection with the Ashaway (R. I.) Woolen Co., to accept the position of designer for the Farwell Worsted Mills, Central Falls, R. I.

—Harry Howard, late bookkeeper with the Enterprise Worsted Co., Millville, Pa., is now filling a similar position with the Tingue Mfg. Co., Seymour, Conn. Mr. Howard was formerly employed by the Tingue Mfg. Co., but in 1897 engaged with the Enterprise Co.

—N. F. Hawley of Webster has been appointed boss spinner of the Indian Spring Woolen Co.'s mill at Madison, Me.

—Henry Haigh, Philadelphia, has taken the place of the late John Mulrooney at the Baltic Mills, Enfield, N. H.

—H. L. Hendries is boss finisher at the Farwell Worsted Mills, Central Falls, R. I., in place of J. J. Kelly, resigned.

—P. J. Keenan has resigned as boss carder with the Staffordville (Conn.) Woolen Co., to accept position of overseer of carding and spinning with the Holstein Woolen Co., Salem, Va., succeeding Joseph S. Taylor.

—Irvin S. Lodge, of Philadelphia, has assumed the position of superintendent of

the Rock Mfg. Co., Rockville, Conn. Mr. Lodge was assistant superintendent at the Hockanum Mill some years ago. For the past two years he has been in England, studying woolen manufacturing in that country. He succeeds F. Swindells.

—John F. Moore, Centreville, R. I., has accepted the position of boss dyer with the Central Woolen Co., Stafford Springs, Conn., recently held by George M. Lawton.

—Israel Marshall, who has been in charge at the Imperial Woolen Co., Mansyunk, Pa., has resigned.

—M. J. Nelson, formerly of Davenport, Iowa, has charge of the finishing at the Reedsburg Woolen Mills, Reedsburg, Wis.

—M. C. O'Brien, Cocheco, N. H., has been appointed boss dyer for the Oneko Woolen Mills, New Bedford, Mass.

—Hiram Oldroyd, for a number of years boss carder in the No. 2 worsted department of the Hartford Carpet Co., Thompsonville, Conn., has severed his connection with the company to engage in the laundry business.

—Oscar Perry has succeeded Timothy Anderson as overseer in the weaving department of Cyrus G. Wood & Co.'s mill at Quinapoxet, Mass. Mr. Anderson has held this position for the past five years.

—William Ranshausen, late overseer of finishing at the Blackinton Co.'s mill, Blackinton, Mass., has engaged in a similar capacity with Holden, Leonard & Co., in their Oneko Mill, New Bedford, Mass.

—Peter Scott, Sherbrooke, P. Q., has been engaged as superintendent of the Warren Woolen Co., Stafford Springs, Conn., to take the place of Charles Bragg, who has resigned to take the treasureship of the new Plainfield Woolen Co., Moosup, Conn., which recently purchased the Kirk Cotton Mills at this place and will manufacture cassimeres and fancy worsteds.

—John Scaife, Bedford City, Va., has recently accepted the position of overseer of carding with the Dresden Woolen Mills, Dresden, O.

—Edward Sheehy, formerly of Rockwell's Mills, N. Y., has secured the position of boss spinner with the Beckman Co., Cleveland, O.

—E. Saunders of Rockville, Conn., has been engaged by the Briggs Mfg. Co., Voluntown, Conn., as boss spinner.

—John Thornton is overseer of carding for the Glendale Woolen Mills, Glendale, R. I.

—S. E. Veazey, who has been in the employ of the Columbus Woolen Mill Co., Columbus, O., since the mill was started, has recently been appointed superintendent of the mill.

—A. J. Waterstreet, superintendent of William Barnet's shoddy mills, Albany, N. Y., for several years past, has resigned in order to accept the management of the yarn spinning and shoddy manufacturing plants of the Mohawk Manufacturing Co., Oswego, N. Y.

—N. Willis Webster, who recently resigned as boss finisher for Holden, Leonard & Co., at the Oneko Woolen Mills, New Bedford, Mass., has accepted the position of traveling salesman with the Mason Manufacturing Co., Woonsocket, R. I., manufacturers of mill soaps.

—C. E. Washburn has resigned as boss dyer at the Blackinton Woolen Mills, Blackinton, Mass., to accept a similar position at the Cocheco Woolen Manufacturing Co.'s mills, East Rochester, N. H.

—J. W. Wilson, formerly at Warsaw, Ill., is the new superintendent at the Beaver Dam Woolen Mills, Beaver Dam, Wis.

—Gustave W. Meyner, of Newton, N. J., has recently accepted the position of foreman in the broad silk department of the firm of R. & H. Simon, Easton, Pa.

Knit.

—O. B. Eaton has resigned as overseer of the mending room in the Sulloway Mills, Franklin Falls, N. Y.

—John W. Hayes has accepted a position as overseer in the Beaver Knitting Mill, Hudson, N. Y.

—John Sherwood has recently succeeded Thomas S. Ritchie as overseer of carding for the Paragon Knitting Co., Mohawk, N. Y.

—J. F. Scott, formerly of Philadelphia, is now boss carder and spinner for Robert MacKinnon, Little Falls, N. Y.

—Lewis White, late of Schuykill Haven, Pa., has accepted a position as boss dyer in Henderson, N. C., with the Seaboard Knitting Mills.

Deaths.

—David Randolph Kenyon, the senior member of the firm of D. R. Kenyon & Son, builders of woolen finishing machinery, died May 16, at his home in Raritan, N. J. He was born October 30, 1836, near Newton, Stillwater Township, Sussex County, N. J. When 15 years old he left school and entered his father's shop to learn the machinist's trade. The partnership of Kenyon Bros. was formed in 1868, and in April, 1895, the firm of D. R. Kenyon & Son was formed. Mr. Kenyon had an ingenious mind, and he obtained many patents on woolen machinery, and made numerous improvements that were not patented. At the time of his death he was a member of the Manufacturers' Club, Philadelphia, a member of the Brigewater Township School Board, and president of the Raritan Savings Bank. His wife, two daughters and a son, Charles C. Kenyon, survive him, the latter, who has been practically the sole manager of the business during the past six years, will continue the business under the same firm name of D. R. Kenyon & Son.

—Joseph Sawyer, a retired dry goods commission merchant, died late lats month, at his home in Boston, aged 77. Mr. Sawyer left school at the age of 14 to enter the retail dry goods store of Josiah Stetson. In 1849 he was admitted to partnership in the woolen jobbing

business of Wilkinson, Stetson & Co., from which he retired in 1862 when he became a member of the firm of E. R. Mudge, Sawyer & Co., to carry on the sale of textile fabrics. This concern, with that of Wilkinson, Stetson & Co., purchased the Burlington Woolen Mills of Wincoski, Vt., and in 1869, Mr. Sawyer became treasurer and subsequently president of the corporation. In 1882, upon the death of E. R. Mudge, the above firm dissolved, and the house of Sawyer, Manning & Co., was organized. Mr. Sawyer retired from business about five years ago. His reputation as a merchant was of the highest, and he was interested, both officially and otherwise, in a number of charitable and benevolent institutions.

—Albert Ray, of the dry goods firm of Lawrence & Co., New York, died last month at the Plaza Hotel, New York City. The deceased was born in Pittsfield, Mass., July 28, 1840. He was a member of the Union League Club, the Merchants' Club, the Chamber of Commerce and the Metropolitan Museum of Art. He had not been in the best of health for some time, and it is believed that the sudden death of his wife, about two months ago, hastened his death.

—Charles N. Wrightington, 31 years old, superintendent of the Ludlow Manufacturing Company's No. 8 mill, Ludlow, Mass., and Foster W. Taft, 28 years old, chief electrical engineer for the company, were drowned in the Chicopee River, May 6th, while attempting to shoot the rapids at Indian Leap Rock. Wrightington was born in Brookline, and was the son of a member of the firm of Potter, Wrightington & Co., Boston. He was a graduate of the Massachusetts Institute of Technology, and had been mill superintendent for seven years. Taft was a native of Providence, R. I., a graduate of Brown University, and had been chief electrical engineer of the plant for a year.

—James Harvey Dunham, head of the dry goods firm of J. H. Dunham & Co., New York, died recently, of pneumonia at his home in that city. He was a trustee of the Atlantic Mutual Insurance Company and the Bowery Savings Bank and was a director in the American Fire Insurance Co., the Central National Bank, the Equitable Life Assurance Society and the United States Lloyds. Mr. Dunham's reputation as one of the oldest merchants in the dry goods trade was of the highest and he leaves behind him the record of a remarkably successful and honorable business career.

—The death of Charles Coupland, on April 27th, was learned with deep regret and sorrow. Mr. Coupland had been connected with the Tingue Manufacturing Co., Seymour, Conn., since its organization in 1881. From its beginning he had been one of its directors and the superintendent of its manufacturing business. Since 1885 he had been its treasurer and general manager of its affairs in Seymour. One daughter survives him.

—John Rutherford died at Oakland, Cal., recently. He was a native of Scotland, coming to America in 1873 to superintend the building of a large factory in Brooklyn. About 10 years ago he went to California and built the mills of the California Cotton Mills Company, Oakland.

—Albert R. Elsasser, a prominent worsted spinner, Philadelphia, died suddenly at his home recently. He was born in Philadelphia, in 1856, and some twenty-five years ago entered the employ of George Campbell & Co., afterwards becoming a partner. In 1891 his connection with this concern was severed, and he united with others in organizing the Clifton Worsted Mills, Clifton Heights, Pa., the firm being dissolved in 1898, when he became sole owner. The Clifton mill was operated by him individually until last year.

—Andrew Vreeland, a retired cotton manufacturer, died recently in Paterson, N. J., in the 86th year of his age. He learned the trade of a machinist, and in 1863 engaged in cotton manufacture with C. H. May and Alexander Rae under the style of May, Rae & Co. In 1878 the firm was incorporated as the Enterprise Manufacturing Co., with Mr. Vreeland as president.

—James Chadwick, president of the Newburgh (N. Y.) Bleachery, died at his home in Newburgh on May 4th. He was 71 years of age, and was born in Heywood, Lancashire, England, where he was first apprenticed in the factory of a relative to learn cotton spinning, and then entered a bleaching and dye establishment. In 1859 he came to America. The deceased and his brother, Joseph, conducted bleaching establishments at Paterson and Rutherford, N. J., until in 1871 the site of the present establishment was purchased. Mr. Chadwick was president of the Palatine Hotel Company, vice-president of the National Bank of Newburgh, president of the Lawson Hose Company, and director of the Newburgh City Club. He was a man whose loss will be greatly felt.

—Daniel Gilligan, superintendent of the Pocasset Manufacturing Co., Fall River, Mass., for the past 10 years, died near Asheville, N. C., late last month, where he had been in the hope of improving his health. He was previously overseer of weaving at the Border City Mills. He was also interested in the Windham Mills, Willimantic, Conn. In the death of Supt. Gilligan, the city loses a man who will be much missed by mill men and his friends will be deprived of a loyal and kindly associate.

—Adolph Rawitser, woolen manufacturer, died at his residence in Stafford Springs, Conn., May 23d. Mr. Rawitser was born near Breslau, Prussia. He came to this country in 1863, and with his brothers entered the raw stock business, under the firm name of Rawitser & Bro. He continued in New York until 1877, during which time he became more or less interested in the manufacture of woolens. In 1877 the above firm was dissolved, and Mr. Rawitser, with his brother Louis, moved to Stafford Springs, where they built up a large manufacturing business. Besides operating the Home, Stafford and River Mills, at Stafford Springs, the two brothers were proprietors of the Mystic (Conn.) Woolen Company and the Meriden (Conn.) Woolen Mills, in all about forty sets of woolen machinery. Besides his brother Louis, his partner in the manufacturing business, two other brothers, Simon and Herman, partners in S. Rawitser & Co., remain.

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Following the use of

CLING-SURFACE.

CLING-SURFACE permanently stops belts slipping, yet permitting clean belts, giving perfectly regular speed of machines.

Allows belts to run easy, never running off, saving frequent taking up.

And keeping the belts water-proof, pliable and in perfect condition.

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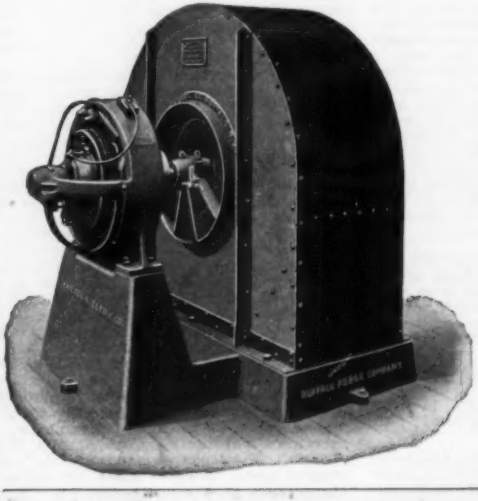
199-205 Virginia St., Buffalo, N. Y.

Boston, 170 Summer St.
New York, 39-41 Cortlandt St.
Philadelphia, The Bourse.

Buffalo Forge Company, Buffalo



BUFFALO
Steel Plate Fans
Steam,
Pulley, Electric,
FOR
Heating,
Ventilating, Drying,
Mechanical
Draft, etc,

Buffalo Forge Company, BUFFALO,

BUYERS' INDEX.

Advertisers whose names do not appear under desired headings will please notify the publishers. Such omissions are accidental, not intentional.

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Air Moistening System.
American Moistening Co., 150 Devonshire St., Boston.

Arc Lamps.
Lea Manufacturing Co., Elwood, Indiana.

Architects and Mill Engineers.
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Gray, Arthur F., Exchange Bldg., Boston.
Lockwood. Greene & Co., 98 Federal St., Boston, Mass.
Praray, C. A. M. & Co., Banigan Bldg., Providence, R. I.

Artificial Stone.
Warren Bros. Co., 143 Federal St., Boston.

Asphalting & Asphalt Materials.
Warren Bros. Co , 143 Federal St., Boston.

Asphalt Roofing.
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Block Cutting for Printing.
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Booth, Benj. & Co., Philadelphia.
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Carpet Machinery.
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Cement "Dealers."
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Chemicals and Apparatus.
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Roessler & Hasslacher Chemical Co, 100 William St, New York.

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Houghton, L. T. & Sons, Worcester, Mass.
Howard & Bullough American Machine Co, Pawtucket, R. I.
Kilburn, Lincoln & Co, Fall River, Mass.
Kitson Machine Co., Lowell, Mass.
Leigh, Evan A, 35 Mason Building, Boston.
Lever, Oswald, Lehigh Ave. and Masher St., Philadelphia.
Lowe, Stephen C., 186 Devonshire St., Boston, Agt. John Hetherington & Sons, Ltd.
Lowell Machine Shop, Lowell, Mass.
Mason Machine Works, Taunton, Mass.
McKerrow, H. G & Co., Boston, Mass.
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Credits.
National Mercantile Agency, New York and Boston.
Cutters for Knit Fabrics.
Kennedy, Thos. (Cutters, etc.,) Cohoes, N. Y.
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Moore, Benj. & Co., Brooklyn, N. Y.
Designer.
Hendry, T., 406 W. 36th St., N. Y.
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Stein, Hirsh & Co, 165 Duane St., New York.
Dryers.
American Blower Co., Detroit.
Arlington Machine Works, (Arthur Birch), Arlington Heights, Mass.
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Smith, Jas. Woolen Machinery Co., Phila.
Sturtevant, B. F. Co, 34 Oliver St, Boston, Mass.
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Philadelphia Drying Machinery Co., 6721 Germantown Ave., Phila.
Philadelphia Textile Machinery Co., Hancock and Somerset Sts., Phila.
Dyers, Bleachers and Finishers
American Yarn Printing Works, 134-180 North 22d St., Philadelphia.
Barnesville Mfg. Co., Barnesville, Ga.
Brophy's, T, Sons, Jasper St, Philadelphia
Cohoes Dye Works, Cohoes, N. Y.
Cranston Worsted Mills (yarns), Bristol, R. I.
Davidson & Brooke, 2560 No. 3rd St., Philadelphia.
Duncan & Baillie, Cohoes, N. Y.
Firth & Foster Co, Kensington, Pa.
Franklin Bleaching & Finishing Works, Ltd., 70th St., and Haverford Ave., Phila.
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Home Bleach & Dye Works, Pawtucket and Valley Falls, R. I.
Knause Bleachery, Hamburg, Pa.
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Molt Bros., Millbury, Mass. (Indigo Blue.)
Pawtucket Dyeing & Bleaching Co, Pawtucket, R. I.
Pond Lily Co., New Haven, Ct.
Rowland, Samuel, Schuylkill Haven, Pa.
U. S. Finishing Co., New York.
Warren, W, Thread Works, Westfield, Mass.
Dyeing, Drying, Bleaching and Finishing Machinery.
Automatic Dyeing & Scouring Machinery Co, Box 80, Madison Branch, New York.
Arlington Machine Works, (Arthur Birch), Arlington Heights, Mass.
Antisdel, E. M., 12 Miller St., Utica, N. Y., (Knit Dryer.)
Birch Bros., Somerville, Mass.
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Curtis & Marble Machine Co, Worcester, Mass.
Delahunty Dyeing Machine Co., Pittston, Pa.
Dubois, A. N., 2170 Ledgely Ave., Philadelphia, Pa. (Black for Hosiery.)
Fairmount Machine Co, 22 and Wood Sts, Philadelphia.

Granger Foundry & Machine Co, Providence, R. I.
Howard, Geo. C., 1783 Barker St., Phila., Pa.
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Klauder-Weldon Dyeing Machine Co., Amsterdam, N. Y.
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Parks & Woolson Machine Co., Springfield, Vt.
Philadelphia Drying Machinery Co., 6721 Germantown Ave., Philadelphia, Pa.
Philadelphia Textile Machinery Co, Hancock and Somerset Sts, Philadelphia, Pa.
Philadelphia Textile Specialty Co., 500 North 12th St., Phila.
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Smith, Jas. Woolen Machinery Co., Phila.
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Dye House Cans.
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Dyehouse Floors.
Warren Bros., 143 Federal St., Boston.

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Haedrich, E. M., Philadelphia, Pa.

Dyestuffs and Chemicals.
Atteaux, F. E. & Co., 174-176 Purchase St., Boston.
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Bischoff, & Co, 87 Park Place, N. Y.
Bosson & Lane, 36 Central Wharf, Boston.
Calmore & Co., 501 Chestnut St., Phila.
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Sturtevant Co., B. F., Boston.

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Electric Motors.
General Electric Co., 44 Broad St., New York.
Sturtevant Co., B. F., Boston.

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Hunt, Rodney, Machine Co, Orange, Mass.
Hunter Jas, Machine Co, No. Adams, Mass.
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Garnetts.
Philadelphia Textile Machinery Co., Hancock and Somerset Sts., Phila.
Smith, Jas. Woolen Machinery Co., Phila.

Gas Engines.
Jones, Lewis, 60½ and Media Sts, Phila, Pa.

Gas Exhausters.
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Saranac Electrical Mfg. Co., St. Joseph, Mich.

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Pearson, J. T, Kensington, Pa.

Humidifying Apparatus.
American Air Moistening Co., Boston.

Hydro Extractors.
American Tool & Machine Co, Boston.
Rusden Machine Co., Warren, R. I.

Ironing Machines for Knit Goods.
Craw, J. W Laundry Machinery Co., So. Norwalk, Conn.

Key Seaters.
Leisenring Mfg. Co , Philadelphia, Pa.
Knit Goods Edgings, Trimmings, etc.
Cathcart, John & Co., 115 Franklin St., New York.
Chapin, Geo. W. Philadelphia, Pa.
Charles, W, B., Amsterdam, N. Y.
Cheney Bros, Silk Goods, 479 Broome St, N. Y.
Friedberger & Co, Edgings, Germantown Phila, Pa.
Hepner & Borwitz, Lacings, 30 Howard St, N. Y.
Krout & Fite Mfg. Co, Allegheny Ave. and Emerald St., Phila.
Schneebeli, G. A. & Co., Nazareth, Penn.
Weimar Bros, 1817 East York St, Phila. Pa.
Knit Goods Finishing Machines, Crochet, Etc.
Craw, J. W. Laundry Machinery Co., So. Norwalk, Conn.
Industrial Mfg. Co., Camden, N. J.
Merrow Machine Co, The, Hartford, Conn.
Nye & Tredick, 606 Arch St, Phila, Pa.
Scott & Williams, 2079 E. Cumberland St, Phila Pa.
Willcox & Gibbs Sewing Mch. Co., New York.
Knitting Machine Cylinders.
Paxton & O'Neill, 129 Bread St, Phila, Pa.
Stafford & Holt, Little Falls, N. Y.
Knitting Machinery.
American Knitting Machine Co., 6th and Arch St., Philadelphia, Pa.
Antisdel, E. M., 12 Miller St., Utica, N Y.
Beattie, Wm. & Son, Cohoes, N. Y.
Branson Machine Co., 506 John St., Philadelphia.
Brinton, H. & Co., 213 Race St., Philadelphia, Pa.
Cooper, Chas, Bennington, Vt.
Crane Mfg. Co, Lakeport, N. H.
Excelsior Knitting Machine Manufacturing Co., Allentown, Pa.
Jenckes, E. Mfg. Co, Pawtucket, R. I.
Jones, Lewis, 60 1-2 and Media Sts, Philadelphia, Pa.
Kennedy, Thos. (Cutters, etc.), Cohoes, N. Y.
Keystone Knitting Machine Mfg. Co., 40 N. 7th St., Phila.
Kutz, S. Jarius Machine Works, Reading, Pa.
Lamb Knitting Mach. Mfg. Co., Chicopee Falls, Mass.
Leighton Machine Co, Manchester, N. H.
Mayo Knitting Machine & Needle Co, Franklin, N. H.
McMichael & Wildman Mfg. Co, Norristown, Pa.
Mueller. Arthur, 760 Lexington Avenue., Brooklyn, N. Y.
Nye & Tredick, 606 Arch St, Phila, Pa.
Paxton & O'Neill, 127 Bread St, Phila, Pa.
Pepper Mfg. Co, Lakeport, N. H.
Scott & Williams, 2079 E. Cumberland St., Phila., Pa.
Snyder, Homer P. Mfg. Co., Little Falls, N. Y.
Stafford & Holt, Little Falls, N. Y.
Taylor, James, 835 Arch St., Philadelphia.
Tompkins Bros., Troy, N. Y.
Knitting Needles and Supplies.
Breedon, Wm, & Son, Amsterdam, N. Y.
Brinton, H. & Co., 213 Race St., Philadelphia, Pa.
Cooper, Chas, Bennington, Vt.
Corey, Wm, Co, Manchester, N. H.
Crane Mfg. Co , Lakeport, N. H.
Dodge Needle Co., Manchester, N. H.
Ives, Loyal T, New Brunswick. N. J.
Keystone Knitting Machine Mfg. Co., 40 N. 7th St., Philadelphia.
Lamb Knitting Machine Mfg. Co., Chicopee Falls, Mass.
Manufacturers' Supplies Co., 66 No. 4th St. Philadelphia.
Mayo Knitting Machine & Needle Co Franklin, N. H.
Page Needle Co , Chicopee Falls, Mass.
Treat, Orion, Manchester Green, Conn.
Wardwell Needle Co, Lakeport, N. H.
Knotter for Spoolers.
Barber & Coleman, 504 Sears Bldg., Boston.
Labeling Machine.
Saranac Electrical Mfg. Co., St. Joseph, Mich.
Laboratory Outfits.
Bullock & Crenshaw, 826 Arch St. Phila, Pa.
Looms.
American Loom Co., Readville, Mass.
Draper Company, Hopedale, Mass.
Fairmount Machine Works, 22d and Wood Sts, Philadelphia.
Furbush, M. A, & Son Co, Phila, Pa.
Howard, Geo. C., 1733 Barker St, Phila., Pa. (For wire.)
Kilburn, Lincoln & Co, Fall River, Mass.
Leigh, Evan A., 35 Mason Bldg., Boston.
Lowell Machine Shop, Lowell, Mass.
Mason Machine Works, Taunton, Mass.
Smith, Jas. Woolen Machinery Co., Phila.
Whitin Machine Works, Whitinsville, Mass.
Loom Pickers.
Loom Picker Co., Biddeford, Me.
Lubricators
Dixon, Jos., Crucible Co, Jersey City, N. J.
Lumber.
Stearns, A. T, Lumber Co, Neponset, Mass.
Lumpers.
Gerry, George, & Son, Athol, Mass.
Machinery Dealers.
Jefferson, Ed, & Bro, 28 Strawberry St, Phila, Pa.
Schofield, Geo. L. Phila., Pa.
Taylor, James, 835 Arch St., Philadelphia.
Machinists' Tools.
Dodge Mfg Co., Mishawaka, Ind.
Leisenring Mfg. Co., Philadelphia, Pa.
Whiton, The D. E. Co, New London, Conn.
Mails.
Walder, J, Paterson, N. J.
Measuring and Folding Machines.
Curtis & Marble Machine Co, Worcester, Mass.
Elliott & Hall, 54½ Hermon St, Worcester Mass.
Fabric Measuring & Packaging Co., Postal Telegraph Bldg , New York.
Parks & Woolson Mach. Co , Springfield, Vt.
Mechanical Draft.
Buffalo Forge Co., Buffalo, N. Y.
Sturtevant Co., B. F., Boston.
Mercerizing Machinery.
Butterworth, H. W. & Sons, Philadelphia.
Granger Foundry & Machine Co., Providence, R. I.
Klauder-Weldon Dyeing Machine Co., Amsterdam, N. Y.
Philadelphia Textile Specialty Co., 500 North 12th St , Phila.
Rusden Machine Co., Warren, R. I.
Mill Architects.
See Architects & Mill Engineers.
Mill Baskets.
Lane, W. T. & Bro., Port Chester, N. Y.
Mill Brushes.
See Brushes.
Mill Builders and Engineers.
American Bridge Co., The, New York.
Ferguson, John W, Paterson, N. J.
Mill Supplies.
American Supply Co, Providence, R. I.
Bamford & Smith, Pascoag, R. I.
Bargamin, G. & A. Co., Richmond, Va.
Bristol, The, Co., Waterbury, Conn
Buckley's, Benj. Son, Gun Mill, Paterson, N. J.
Carpenter, Geo. B. & Co., Chicago, Ill.
Dixon Lubricating Saddle Co., Bristol, R.I
Dodge Mfg. Co., Mishawaka, Ind.
Douglas, R. D., Fall River, Mass.
Easton-Burnham Co., Pawtucket, R. I.
Jefferson, Ed, & Bro, 28 Strawberry St, Phila, Pa.
Jeffrey Manufacturing Co., Columbus, O.
Lane, W. T. & Bro., Port Chester, N. Y.
National Supply Co., Paterson, N. J.
Smith, Jas. Woolen Machinery Co., Phila.
Southern Bobbin Co., Greensboro, N. C.
Star Mfg. Co., Stamford, Conn.
Sweet & Doyle, Cohoes, N. Y
Thurston, A. G, & Son, Fall River, Mass.
Watson, L. S, Mfg.Co, Leicester, Mass.
Napping Machines.
American Napping Machine Co, Williamstown, Mass.
Columbia Napping Machine Co., Somerville, Mass.

Curtis & Marble Machine Co, Worcester, Mass.
Jones, Lewis, 00 1-2 and Media Sts., Philadelphia, Pa.
Parks & Woolson Mach. Co., Springfield, Vt.

Noils (Silk.)
Ryle, Wm. & Co., 54 Howard St., N. Y.
Malcolm Mills Co., Frankford, Pa.

Oil Cabinets.
New York Oil Cabinet Co., New York.

Oil Filters.
Burt Manufacturing Co., Akron, Ohio.

Packing.
Boston Belting Co , Boston.
Jenkins Bros., New York.

Paint.
Moore, Benj. & Co, Brooklyn, N. Y.

Pantagraphs for Mill Engraving.
Johnson, C. A, & Co, 22 Dey St, New York.

Paper.
Beck, Chas. Paper Co., Ltd., 607 Chestnut St., Phila.

Paper Boxes.
Beck, Chas. Paper Co., Ltd., 607 Chestnut St., Phila.

Paper Box Machines.
Beck, Chas. Paper Co., Ltd., 607 Chestnut St., Phila.

Paper Tubes.
Douglas, R. D., Fall River, Mass.

Patent Solicitors.
Crosby & Gregory, 34 School St, Boston, Mass.
Siggers, E. G., Washington D. C.
Wolhaupter, D. P., Equitable Bldg., Washton, D. C.

Pavers & Paving Materials.
Warren Bros. Co., 143 Federal St., Boston.

Perforated Metal.
American Perforated Metal Co., 171 Wooster St., New York.
Beckley, A. J. & Co., Garwood, N. J.

Peroxide of Sodium.
Roessler & Hasslacher Chemical Co., 100 William St, New York.

Picker Sticks.
Loom Picker Co., Biddeford, Me.
Southern Bobbin Co., Greensboro, N. C.

Pipe Covering.
Keasbey, R. A. 83 Warren St, New York.

Plumbers' Supplies.
Bargamin, G. & A. Co., Richmond, Va.

Pneumatic Conveying.
See Ventilating.

Power Transmitting Machinery.
Beggs, James & Co., 9 Dey St., New York.
Carpenter, Geo. B. & Co , Chicago Ill.
Dodge Mfg. Co , Mishawaka, Ind
Eastern Machinery Co, New Haven, Conn.
Fairmount Machine Works, 22d and Wood Sts, Philadelphia.
Howard, Geo. C., 1788 Barker St., Phila., Pa.
Hunter, Jas, Machine Co, No. Adams, Mass.
Jeffrey Manufacturing Co., Columbus, O.
Kilburn, Lincoln & Co, Fall River, Mass.
Lambeth Rope Corporation, New Bedford, Mass.
Link Belt Machinery Co, Chicago, Ill.
Rusden Machine Co., Warren, R. I.
Philadelphia Drying Machinery Co., 6721 Germantown Ave., Phila.
Saginaw Manufacturing Co., Saginaw, Mich.
Smith, Jas. Woolen Machinery Co., Phila.

Preparatory Machinery, (Cotton).
Atherton, A. T., Mach. Co., Pawtucket, R. I.
Howard & Bullough Am. Machine Co., Pawtucket, R. I.
Kitson Machine Co., Lowell, Mass.
Saco & Pettee Machine Shops, Newton Upper Falls, Mass.

Presses.
Boomer & Boschert Press Co., 338 West Water St., Syracuse, N. Y.
Butterworth, H. W. & Sons Co., Philadelphia.
Crawford. J. J, & Son, Nashua, N. H. (Power Screw, Hydraulic, Hollow Steam Plate.)
Curtis & Marble Machine Co, Worcester, Ma.
Hart, Charles, Frankford, Philadelphia.
Howard, Geo. C., 1788 Barker St., Phila., Pa.
Phillips Co, The Thomas, Providence, R. I.

Printers (Fabrics and Yarn.)
American Yarn Printing Works, Philadelphia.

Pulleys.
See Power Transmitting Machinery.

Pulley Covers.
Acme Pulley Covering Co., 1 West 103rd St., New York.
Vacuum Cement & Pulley Covering Co., 1498 Third Ave., New York.
Warren Mfg, Co., 239 Franklin St., Chicago Ill.

Pumps.
Goulds Mfg. Co, Seneca Falls, N. Y.
Rusden Machine Co., Warren, R. I.

Purifying & Filtration Plants.
Scaife, W. B. & Sons, Pittsburg, Pa.

Rag Pickers.
Smith, Jas. Woolen Mach. Co., Phila, Pa.

Raw Hide Gears.
New Process Raw Hide Co. Syracuse, N. Y

Reed and Harness Manufacturers.
American Supply Co, Providence, R. I.
Loom Picker Co., Biddeford, Me.
Walder, J, Paterson, N. J.

Ribbons.
Barton, F. C., 54 Franklin St., New York.
Cheney Bros, S. Manchester, Ct.

Ring Travellers.
National Ring Traveller Co., Providence, R. I.
Morley Button Mfg. Co., Boston.

Roofing Asphalt.
Warren Bros. Co. 143 Federal St., Boston.

Roofing Materials (Manufacturers).
Warren Bros. Co., 143 Federal St., Boston.

Rope Transmission.
American Mfg. Co., New York.
Carpenter, Geo. B. & Co., Chicago, Ill
Dodge Mfg. Co , Mishawaka, Ind.
Lambeth Rope Corporation New Bedford, Mass.
Link Belt Mfg Co., Chicago, Ill.

Roving Cans
Hill, James Mfg. Co., Providence, R. I.
N. E. Ventilating & Heating Co, 930 Manton Ave. Providence, R. I.
Laminar Fibre Co., No. Cambridge, Mass.
Walrus Fibre Mfg. Co., Medford, Mass.

Rubber Covered Rollers and Goods.
Boston Belting Co., Boston.

Saddles and Stirrups.
Dixon Lubricating Saddle Co., Bristol, R. I.

Sample Cards and Mounting.
Merchants Sample Card Co., 33 Sullivan St., New York.

Scales
Sweet& Doyle, Cohoes, N. Y.

Schools.
American Correspondence School of Textile, New Bedford, Mass.
Georgia School of Technology, Atlanta, Ga.
Lee's College, Charlotte, N. C.
New Bedford Textile School, New Bedford, Mass.
Lowell Textile School, Lowell, Mass.
Philadelphia Textile School, Phila, Pa.

Screens (Perforated.)
See under Perforated Metal.

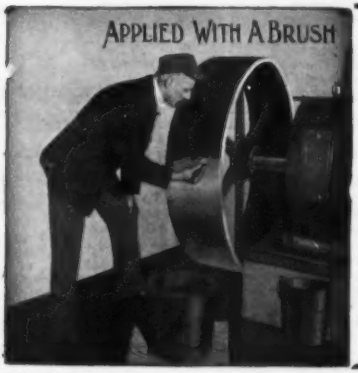
Selling Agents.
See Commission Merchants.

Separators.
Ring Frame Thread Protector Co., The Amsterdam, N. Y.
Draper Co , The, Hopedale, Mass.

Separators, Oil and Steam.
Austin Separator Co., Detroit, Mich.

Sewing Machines and Supplies
Arlington Machine Works (Arthur Birch), Arlington Heights, Mass.
Birch Bros., Somerville, Mass.
Curtis & Marble Machine Co, Worcester, Mass
Fales, L. F., Walpole, Mass.
Industria Mfg. Co., Camden, N J.
Manufacturers' Supplies Co , 66 No. 4th St., Philadelphia.
Rusden Machine Co., Warren, R. I.
Union Button Sewing Mch. Co , 164 High St., Boston.
Willcox & Gibbs S. M. Co., New York.

Shafting Hangers, Etc.
See Power Transmission Machinery.



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See Wool Shoddies.
Shuttles.
See Bobbins, Spools, Shuttles, Etc.
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Butterworth, H. W. Sons Co, Philadelphia.
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Knapp, C. H., Paterson, N. J.
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Singe Plates.
Butterworth, H. W. Sons Co., Philadelphia.
Taunton-New Bedford Copper Co., New Bedford, Mass.
Singeing Machines.
Arlington Machine Works, (Arthur Birch), Arlington Heights, Mass.
Birch Brothers, Somerville, Mass.
Butterworth, H. W. Sons Co., Philadelphia.
Curtis & Marble Machine Co, Worcester, Ms.
Granger Foundry & Machine Co., Providence, R. I.
Knapp, C. H, Paterson, N. J.
Rusden Machine Co., Warren, R. I.
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Potter, R. V. B., 231 Chestnut St., Phila.
Stein, Hirsch & Co, 165 Duane St, New York.
Sky Lights.
Drouve, The G. Co., Bridgeport, Ct.
Slashers.
Cohoes Foundry & Machine Co, Cohoes, N. Y.
Lowell Machine Shop, Lowell, Mass.
Phillips The Thomas, Co., Providence, R.I.
Soaps.
India Alkali Works, Boston, Mass.
O. K. Soap Co., 968 Franklin St., Phila.
Spindles.
Bamford & Smith, Pascoag, R. I.
Buckley, Benj's, Sons, Gun Mill, Paterson, N. J.
Draper Company, Hopedale, Mass.
Easton-Burnham Co., Pawtucket, R. I.
Ward & Undergrift, Elmer, N. J.
Whitin Machine Wks, Whitinsville, Mass.
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Bamford & Smith, Pascoag, R. I.
Spinning Cylinders.
N. E. Ventilating & Heating Co, 930 Manton Ave, Providence, R. I.
Spinning Frames.
See Cotton Machinery.
Spinning Rings.
Draper Company, Hopedale, Mass
Whitinsville Spinning Ring Co, Whitinsville, Mass.
Spinning Tubes.
Buckley, Benj's. Son, Gun Mill, Paterson, N. J.
Spools. *See Bobbins, Spools Shuttles, Etc.*
Spool Cotton for Mfrs. Use.
Standard Thread Co., New York.
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Spooler Knotter.
Barber & Coleman, 504 Sears Bldg., Boston.
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International Sprinkler Co., Philadelphia, Pa.
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Babcock & Wilcox Co., The, 29 Cortland St., New York City.
Brown, C. H, & Co, Fitchburg, Mass.
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Hartford Steam Boiler Inspection & Insurance Co, Hartford, Conn.
Steam Engines.
American Blower Co, Detroit, Mich.
Brown, C. H, & Co, Fitchburg, Mass.
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Hooven (The), Owens & Rentschler Co, Hamilton, O.
Rusden Machine Co., Warren, R. I.
Sturtevant, B. F. & Co., Boston.
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Keasbey, Robert A., New York.
Steam Specialties.
Austin Separator Co., Detroit, Mich.
Butterworth, H. W. Sons Co., Philadelphia.
Rusden Machine Co., Warren, R. I.
Jenkins Bros., New York.
Sturtevant Co., B F., Boston.
U. S. Rocking Grate Bar Co., Elizabeth, N.J.
Steam Valves.
Jenkins Bros., New York.
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Caldwell Co., W. E. 202 Brook St., Louisville, Ky.
Cypress Lumber Co, Apalachicola, Fla.
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Rusden Machine Co. Warren, R. I.
Stearns, A. T, Lumber Co, Neponset, Mass.
Woolford, George, 2240 No. 9th St, Phila, Pa.
Tapes, Braids and Edgings.
Barton, F. C., 54 Franklin St., New York.
Cathcart, John, & Co, 115 Franklin St, N. Y
Chapin, Geo W Philadelphia, Pa.
Friedberger Mfg. Co, Germantown, Pa.
Krout & Fite Mfg. Co., Allegheny Ave. and Emerald St., Philadelphia.
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Plummer, F. O. 620 Atlantic Ave., Boston.
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American Loom Co., Readville, Mass.
Draper Co., Hopedale, Mass.
Tension Pulleys.
N. E. Ventilating & Heating Co, 930 Manton Ave. Providence, R. I.
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See Dyeing, Bleaching Machinery, Etc.

Tenter Clips.
See Dyeing, Drying, Bleaching and Finishing Machinery.
Testing Machines.
Howard, Geo. C., 1783 Barker St., Phila., Pa
Textile Schools.
See Schools.
Thread Board for Spinning & Twisting Frames.
Houghton, L. T. & Sons, Worcester, Mass.
Thread Protectors.
Ring Frame Thread Protector Co., The, Amsterdam, N. Y.
Tickets and Labels.
Saranac Electrical Mfg Co. St. Joseph, Mich.
Time Recorders.
Simplex Time Recorder Co., Gardner, Mass.
Towers.
Caldwell Co., W. E. 202 Brook St., Louisville, Ky.
Tower Clocks.
Howard, E. Clock Co., Marlboro Building, Boston.
Trimmers.
Excelsior Sewing Machine Co , Philadelphia.
Turbine Governors.
Replogle Governor Works, Akron, O.
Turbines.
(See Water Wheels.)
Valves—Rubber.
Boston Belting Co., Boston, Mass.
Ventilating Apparatus.
Allington & Curtis Mfg. Co , Saginaw, Mich., 81 Wareham St., Boston.
American Air Moistening Co., Boston.
American Blower Co., Detroit, Mich.
Berry, A. Hun, 23 W. 1st St, Boston, Mass.
Buffalo Forge Co., Buffalo, N. Y.
Drouve, The G. C ., Bridgeport, Ct.
National Pancoast Ventilator Co., Philadelphia, Pa.
New England Ventilating & Heating Co, Providence. R. I.
Philadelphia Drying Machinery Co., 6721 Germantown Ave., Philapelphia.
Philadelphia Textile Machinery Co, Hancock St, above Lehigh Ave, Phila, Pa.
Sargent's, C. G., Sons, Graniteville, Mass.
Sturtevant, B. F. Co, 34 Oliver St, Boston, Mass.
Wing, L. J. Mfg. Co., 95 Liberty St., N. Y.
Wall Whitening.
Moore, Benj. & Co, Brooklyn, N. Y.
Warp Stop Motions.
Am. Loom Co., Readville, Mass.
Draper Co., Hopedale, Mass.
Washers (Cloth).
Arlington Machine Works, (Arthur Birch), Arlington Heights, Mass.
Birch Brothers, Somerville, Mass.
Butterworth, H. W. & Sons Co., Philadelphia.
Hunt, Rodney, Machine Co, Orange, Mass.
Hunter, Jas, Machine Co, No. Adams, Mass.
Kenyon. D. R., & Son, Raritan, N. J.
Phillips Co, The Thomas, Providence, R. I.
Rusden Machine Co , Warren R. I.
Webendorfer & Walling, Paterson, N. J.
Watchman's Clocks.
Am. Watchman's Time Detector Co., Broadway, N. Y.
Eco Magneto Clock Co, 620 Atlantic Ave, Boston.
Howard, E. Clock Co., Marlboro Building, Boston.
Nanz & Co, 127 Duane St., New York.
Waterproof Floors.
Warren Bros. Co., 143 Federal St., Boston.
Water Purifiers & Filters.
Scaife, W. B. & Sons, Pittsburg, Pa.
Water Wheels.
Alcott, T. C., & Son, Mt. Holly, N. J.
Hunt, Rodney, Machine Co, Orange, Mass.
Leffel, James, & Co, Springfield, O.
Water Wheel Governors.
Cohoes Foundry & Machine Co, Cohoes, N. Y.
Leffel, James & Co, Springfield, Ohio.
Replogle Governor Works, Akron, O.
Winders. (Back.)
Taylor, Jas., 835 Arch St., Philadelphia.
Winder Bobbins.
Sweet & Doyle, Cohoes, N. Y.
Winders. (Hosiery.)
Altemus, W. W. & Son, Philadelphia.
Foster Machine Co., Westfield, Mass.
Lever, Oswald, Lehigh Ave. and Mascher St., Philadelphia.
Universal Winding Co, 95 South Street Boston.
Wood Pulleys.
Beggs, James & Co., 9 Dey St., New York.
Dodge Mfg Co., Mishawaka, Ind.
Saginaw Manufacturing Co, Saginaw, Mich
Wool Burrer.
Cheesman Co., 27 William St., New York.
Wool Cleaning Compound.
India Alkali Works, Boston.
Wool Combing Machinery.
Leigh, Evan A. 35 Mason Bldg., Boston.
Wool and Waste Dusters.
Atlas Foundry and Mch. Co., Newark, N. J.
Gerry, Geo. & Son, Athol, Mass.
Sargents', C. G., Sons, Graniteville, Mass.
Smith Jas. Woolen Machinery Co., Phila.
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Fales, L. F , Walpole, Mass.
Woolen and Worsted Machinery.
Altemus, W. W, & Co, 2816 N. 4th St, Phila, Pa.
American Tool and Machine Co., Boston.
Arlington Mch. Works (Arthur Birch), Arlington Heights, Mass.
Atlas Foundry and Mch Wks., Newark, N.J.
Birch Brothers, Somerville, Mass.
Butterworth, H. W. Sons Co., Philadelphia.
Cheesman Co., 27 William St , New York.
Curtis & Marble Machine Co, Worcester, Mass.
Fairmount Machine Works, 22d and Wood Sts, Philadelphia.
Furbush, M. A. & Son Machine Co, Phila, Pa.
Howard, Geo. C., 1783 Barker St., Phila., Pa.
Hunt, Rodney, Machine Co, Orange, Mass.
Hunter, Jas, Machine Co, No. Adams, Mass.
Jefferson, Ed, & Bro, 28 Strawberry St, Phila, Pa.
Kenyon D. R. & Son, Raritan, N. J.
Leigh, Evan A. 35 Mason Bldg, Boston.
Lever, Oswald, Lehigh Ave. and Mascher St., Philadelphia. Pa.
Lowe, Stephen C., 186 Devonshire St., Boston. Agt. John Hetherington & Sons, Ltd.
Parks & Woolson Machine Co., Springfield, Vt.
Philadelphia Drying Machinery Co., 6721 Germantown Ave , Philadelphia.
Philadelphia Textile Machinery Co., Hancock and Somerset Sts., Philadelphia.
Phillips Co. The Thomas, Providence, R. I.
Rusden Machine Co., Warren, R. I.
Sargent's, C. G., Sons, Graniteville, Mass.
Schofield, Geo. L., Philadelphia.
Smith, Jas. Woolen Machinery Co., Phila.
Wool Shoddies.
Slack, Wm. H. B., & Bro, Springfield, Vt.
Wool Washing, Preparing and Drying Machinery.
Hunter, Jas. Machine Co., No. Adams, Mass.
Philadelphia Drying Machinery Co., 6721 Germantown Ave., Philadelphia
Philadelphia Textile Machinery Co., Hancock and Somerset Sts., Phila.
Phillips Co, The Thomas, Providence, R. I.
Sargent's, C. G, Sons, Graniteville, Mass.
Smith, Jas. Woolen Machinery Co., Phila.

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Moore, C. & Co, 12 S. 5th St, Phila, Pa
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Solis, Andrew J, Jr, & Co, 179 Devonshire St, Boston, Mass.
Tucker & Cook Mfg. Co, Conway, Mass.
Whittier Cotton Mills, Lowell, Mass.

Cotton Yarns.
American Cotton Yarn Exchange, 67 Chauncy St., Boston.
Barnesville, Mfg. Co., Barnesville Ga.
Buckingham & Paulson, 83 Leonard St., New York.
Catlin & Co, New York and Boston.
Charles, W. B., Amsterdam, N. Y.
Dana Warp Mills, Westbrook. Me.
Dexter Yarn Co., Pawtucket, R. I.
Dodds, J. S., 517 Wool Exchange, New York
Eddy & Street, Providence, R. I.
Spring St., N. Y.
Eichmann & Sternberg, New York.
Grant Yarn Co, Fitchburg, Mass.
Greene & Daniels Mfg. Co, Pawtucket, R. I.
Indian Orchard Co., Indian Orchard, Mass.
Jenckes, E., Mfg. Co., Pawtucket, R. I.
Mitchell, Jas. E, & Co, Boston and Phila, Pa.
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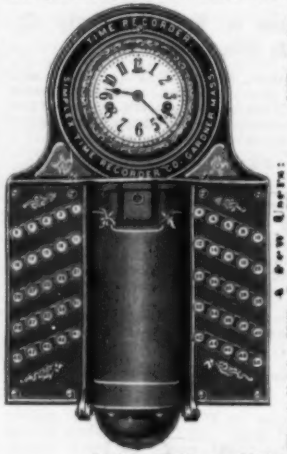

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The advertisers in the following columns should be addressed in care of TEXTILE WORLD or inquiries concerning them may be addressed directly to "Information Department TEXTILE WORLD," as full particulars of each advertiser are on file, and the addresses of suitable agents, superintendents and foremen for every branch of the textile industry will be furnished to manufacturers.

Any subscriber may file his application, and no charge is made until position is secured.

The business of this department is held strictly confidential.

The applications of good overseers in every department, who are in want of positions are solicited.

Manufacturers are invited to use this department when in need of skilled men; each case will be handled confidentially, with promptness and judgment, and without charge to manufacturers.

WOOLEN SUPERINTENDENTS.

1829 **Woolen Supt.**, or asst. or dyer. Age 35; American; married. Has worked on kerseys, coverts, worsteds, cassimeres, etc. Is familiar with Davis & Furber jackets and mules, and Crompton & Knowles.

880 **Supt. or Assistant Supt.** and Designer. Over 25 years experience as Supt. and designer. Has designed and manufactured nearly all classes of goods made in a woolen mill, in wool and worsted, such as shawls, blankets, beavers, kerseys, cheviots, fancy cassimeres, overcoatings, worsted suitings, etc. 53 years old, married, with family. Would go west or nearly anywhere. Wants a mill where he can permanently settle and give them the benefit of his experience as a manufacturer. A first-class man.

1890 **Manager or Supt.** of a woolen mill, who understands designing, is open to an engagement. 34 years old; Scotch, and single. Large experience in Scotch and Canadian mills on tweeds, worsteds, overcoatings, etc. Good references.

1891 **Supt. of Woolen or Worsted** Mill, who understands designing, is open to a position. 23 years of age; an American; single. Well recommended, and with good experience.

1823 **Supt., Designer or Overseer** of weaving. Age 44; English; married. Large experience on fancy cassimeres, cloakings, beavers, meltons, plaid backs, golf caps, rugs, union worsted suitings and government work, flannels, face-finished goods, and can make them up from the yarn. Is familiar with Crompton & Knowles and English looms.

1398 **Woolen Superintendent or Designer** of recognized ability and at present employed as a superintendent of 36 set woolen and worsted mill. He finds it necessary to remove from New Jersey on account of his wife's health. His past record is first-class and this is an unusual opportunity to secure the services of a first-class superintendent.

1575 **Assistant Supt. Woolen.** A graduate of the Philadelphia Textile School (highest standing), and has had more than 7 years' experience in the various departments of a Massachusetts mill. Wants to get a start where there is fair chance of advancement. Age 28, single.

1856 **Supt. Worsted Yarn Mill.** 35 years old; Scotch; married. All kinds of worsted yarns in the gray mixtures and mottled, especially fine numbers. Bradford system.

COTTON SUPERINTENDENTS.

1877 **Agent or Treasurer.** Good references. Recently assistant manager of a large mill. Fully competent.

1806 **I would like** to correspond with some president or manager of some cotton mill now running or any new mill now being constructed, who would like to engage a competent superintendent. I want to engage with a cloth mill of any number of spindles not exceeding 10,000. My price is $1,000 a year, with no loss of time. I am a practical manufacturer, of long experience as overseer and superintendent. I am a good manager, full of push and energy, and I have a good record as a hustler for big productions and making money for my employers. Strictly temperate.

1802 **Supt.** or agent of small cotton or knitting mill, or would take a position as overseer of cotton carding. 33 years old; American. Has worked on sheetings, shirtings and fancy goods, and hosiery and mill supplies. Wants about $25 per week.

1867 **Assistant Manager** who understands the handling of cottons and linens, desires position in a cotton mill. 24 years of age; American; unmarried. Can satisfy anyone in regard to references, experience, etc.

1872 **Supt. and Carder of Cotton.** Has handled all classes of goods. 35 years; American, married. Best of references.

1806 **Supt. of a Cotton Weaving Mill,** colored or white, 5,000 to 10,000 spindles; or overseer of weaving in a cotton mill, on any kind of work and any size mill, white or colored. Will go East, West, North or South, Canada or Mexico. Has had good and long experience. A married man; 40 years old, strictly temperate. Can give references as to ability and character.

1772 **Supt. or Overseer of Weaving.** Age 38; American; married. Lawns, fine sheetings and shirtings, sateens, twills, fancies, denims and cottonades. Is familiar with Whitin, Lowell, Draper, Northrop and English machinery. Not at present employed.

423 **Cotton Supt. and Carder** desires position. Large experience on all kind of English and American machinery. Thoroughly understands handling Southern help. An American; married; 40 years of age.

1453 **Superintendent** desires position in a cotton mill. Age 28; married; American. Has worked on prints, fine sateens, sheetings, ginghams duck, denims, cottonades, ticks, awnings and domets. Is familiar with all makes of spinning, spooling and warping machinery. Refers to past employers.

WOOLEN CARDERS.

1798 **Boss Carder,** or carder and spinner. Age 49; English. Large experience on fine, medium and coarse wool, also wool, cotton and shoddy mixes, cassimeres, flannels, blankets, kerseys, meltons, beavers, government goods, etc. Excellent references and first class man in every respect. Was nine years boss carder in England and has held good positions in this country as boss carder and spinner.

1701 **Boss Carder.** Age 39; English; married. Has had large experience as boss carder in Canadian mills, also held positions in England before coming to this country. Has worked on all kinds of wool, cotton waste, mungo and shoddy mixes, cassimeres, dress goods, knit goods, blankets. Can take position at once. Excellent references.

1827 **Overseer of Woolen Card** Room. Has worked on blankets, robes, friezes, cheviots, kerseys, flannels, knit goods, cassimeres, hair lines and unions. Age 34; American; married. Wants not less than $3.00 per day.

1801 **Overseer of Carding.** Age 27; German; married. Dress goods, knit goods, wool and cotton mixes, blankets and paper makers' felts. Is familiar with all kinds of American machinery. Wants $3.00 per day.

1660 **Overseer of Woolen Carding.** Does not want to go out of N. E. States. Age 48; American; married. Many years' experience as overseer and has excellent references. Has worked on nearly every class of goods manufactured in N. E., and is familiar with nearly all machinery.

COTTON CARDERS.

1886 **Overseer of Cotton Carding;** 31 years of age; married; of English parentage; desires position in the Middle, Atlantic or New England States. Familiar with Lowell, Pettee, Biddeford, Woonsocket, Whitin, Mason and all makes of pickers of above machinery. Good references.

1893 **Boss Carder of Cotton.** 38 years old; married; an American; who can also handle a weave room of from 300 to 500 looms, wishes to make a change. Has had over 15 years' experience in New England mills. Best of references.

1880 **Second Hand in Card Room** or Second Hand of Combers. 25; American; unmarried. 6 years' experience on fine and coarse cotton, including Sea Island, Egyptian, Peeler, etc. Best of references.

1884 **Overseer of Cotton Carding.** 42 years old; French; married; desires a position in any mill north of Pennsylvania. Long experience in several large New England mills. Familiar with all makes of English and American machinery. Best of references. Has one son in family, third hand in card room.

1759 **Overseer of Carding Room.** Age 26. Has worked on fine and coarse yarn, and understands all makes of machinery in carding. Good manager of help by speaking different languages. At present overseer in a small mill. Excellent reference as to character and ability. Wants from $3.00 to $3.50 per day.

WOOLEN WEAVERS.

1645 **Overseer Weaving.** Age 30; married, American. Has worked in weave room since he was 17 years old as weaver, fixer and secondhand of weaving, except for a short time was traveling salesman. Has worked on ladies' dress goods, men's fine worsted suitings, overcoatings, cloakings, etc., on Crompton & Knowles and Jacquard looms. Excellent references.

1878 **Woolen** Overseer of Weave room. American; married. Very large experience in New England mills, on union cassimeres, chinchillas, dress goods, meltons, kerseys, fancy woolen suitings, and government goods, also fine fancy worsted suitings. Knowles & Crompton looms. A 1 references.

1482 **Weaver or Wool Sorter.** Has worked on cassimeres, cheviots, tricots, kerseys and cloakings. Good references.

1688 **Overseer of Weaving** in large mill, designer in small mill, or assistant designer in a large mill. Age 38; German; single. Has worked on beavers, chinchillas, fine cassimeres, fine fancy worsteds, ladies' dress goods, army goods, union cassimeres and other classes of goods. Strictly temperate and industrious.

1805 **Boss Weaver.** Has worked on fancy dress goods, cashmeres, ginghams, fancy worsteds, coatings, lenos and Jacquards. Has also some knowledge of designing. English; age 36.

COTTON WEAVERS.

1806 **Wanted a Situation** as Boss Weaver or Second Hand, on any kind of plain weaving in cotton, wool, or jute mill. Has had 10 years' experience as boss weaver and 15 years experience as second hand and loom fixer. Am a married man, sober, steady, a good manager of help and a hustler for good productions. Can give good references as to ability, sobriety, and character. Will go to any part of U. S., Canada or Mexico.

1738 **Overseer of Weaving,** Drawing in, Warping, Slashing, and all preparations, 14 years experience in colored mill in Manchester, Eng., and two years in this country. Age 37; English; married. Has worked on sateens, drills, dress goods, zephers, turkish towels, and can pick out own pattern for weaving and drawing-in. Understands the different makes of looms. Wants $3.00 per day.

1879 **Overseer of Weaving** or Assistant Supt. 17 years' experience in New England cotton mills, having charge of 1300 looms for 6 years recently. Fine and coarse goods on all well known machinery. Best of references.

1752 **Overseer of Cotton Weaving,** or Supt. in small mill. 30 years of age; American, and married. Have worked on all kinds of plain and fancy cottons and thoroughly understand jacquard work. Will go anywhere in the U. S. Best of references.

1826 **Wanted by Steady, Industrious** man, a situation as overseer, in Tape mill. Has had considerable experience, but does not know everything, but willing to improve. $2.25 per day. Has been overseer a short time, and has perfect control of help. Age 46; English; married. No family. Would go anywhere, and settle.

WOOLEN SPINNERS.

1691 **Boss Spinner.** Large experience in first-class N. E. mills on flannels and all kinds of fancy cassimeres. Englishman; age 50; married. Refers to past employers.

1784 **Worsted Drawer and Spinner.** Would take twisting. Age 2-; English; single. Can furnish references as to ability and character.

633 **Woolen Mule Spinner** desires to move from Maine on account of wife's health. At present in good position. Age 37; married, Scotchman.

1862 **Overseer of Spinning.** Is used to Johnson & Bassett, Davis & Furber and Campbell & Clute machines. Has had 18 years' experience as an overseer. Is a handy man, and can give good references. Wool, cotton and mixtures.

1834 **Overseer of Spinning.** Experience covers eight years as second-hand and fixer and eleven years as overseer. Has handled nearly all kinds of goods. Is an expert fixer. Worked on Davis & Furber mules. Age 38; American; married.

1820 **Overseer in Woolen Spinning.** Has worked on ladies' dress goods, cassimeres, cheviots, beavers, all wool, and wool and cotton, and wool, cotton and shoddy mixes, from 1 run to 9. Davis & Furber Johnson & Bassett and Platt mules and jacks Refers to past employers. Wants $2.50 per day.

COTTON SPINNERS.

1068 **Overseer of Frame Spinning,** Twisting, Spooling and Warping desires position and would accept that of second-hand. Has worked in some of the best mills in N. E. (37 years old, an American and single) on Nos. running from 4s to 80s. Is familiar with Whitin, Mason, Biddeford and Lowell machines. Will go to any of the N. E. or Middle States. A1 references, and does not expect a fancy price.

1869 **Overseer or Second Hand** of ring spinning, cone winding, twisting, spooling, cop winding, reeling. 27 years of age; American; single. Of good experience on fine and coarse cotton yarns. Competent and reliable and used to handling all the well known makes of machinery. Will go anywhere. Good references.

1779 **Boss Mule Spinner.** Now employed in South, but wants to change on account of climate. Has had 15 years' experience as a cotton spinner, working up to overseer from back boy. Is well acquainted with all makes of English mules, also latest Mason mules, and is familiar with the working of all drafts and twists. Married; 30 years old, and temperate.

1889 **Boss Spinner of Cotton.** 30 years old, American; married. Familiar with all classes of hosiery yarns and all makes of machinery; 16 years' experience Wages expected $125 per month. Best of references.

1690 **Cotton Mule Spinner.** Age 42; French; married. Has worked on prints and sheetings and on yarns from 9's to 50's. First class references. Two years' experience as secondhand and five as overseer. Wants $2.50 per day to start with.

KNITTERS.

1833 **Wanted.** A position as superintendent of woolen mill manufacturing wool, or wool mixed hosiery or underwear. Is a practical man, understands carbonizing and mixing of stock, etc. References furnished.

1819 **Overseer or Second Hand** of Knitting. Am 27, married, and an American. Have worked on silk, worsted, lisle, cotton and fancy mixed yarns. Understand Scott Williams, Snyder & Fisher, or any latch needle machines. Will work for reasonable wages and go anywhere in N. E. and Middle States. Best of references.

1874 **A Responsible Boss Knitter** of 18 or 20 years experience. 36 yrs. of age; American married. Thoroughly understands underwear and hosiery knitting, flat and circular. Excellent references. Will go anywhere.

1824 **Boss Knitter or Fixer** on ribbed underwear. Has worked on fancies, double knees and tops and plain work. Is familiar with Brinton & Denny, McMichael & Wildman, Huse and Pepper machinery Will work for $2.50 or more, according to position.

1812 **Boss Knitter** on latch needles, or sewing machine fixer. Age 35; American; married. Has had twelve years' experience, and can handle any kind of latch needles. Excellent references as to character and ability.

1892 **An Overseer or Fixer** on Standard, Mayo, Scott and Williams, 8. & C. rib, Britton and loopers, desires position. Has worked principally on fine seamless hosiery. 21 years of age; French; single; good references; six years' experience.

DYERS.

1626 **Dyer and Finisher,** with experience on plushes, dress goods, mohair and worsted genapped yarns, cotton and woolen yarns, raw stock. At present employed, but will consider position paying $3 a day.

1864 **Boss Dyer.** Age 34; American; married; desires a position. Has had good experience on wool and cotton mix goods. Employed at present but could take new position in about one week. Good references.

1860 **A First-Class Boss Dyer** wants position. 50 years old; German; single. Has managed some large New England dye houses and is familiar with worsteds, woolens, mohairs, knit goods, pieces, yarn, slubbing, loose wool, carret yarns and cotton yarns Will go anywhere and can give references that will satisfy anyone as to his ability.

1871 **Fast Black Dyer** on cotton hosiery Knows a new and secret process of dyeing an aniline fast black, with or without the lisle finish. Guaranteed fast and sanitary.

1883 **A Boss Dyer** who understands cotton and wool raw stock dyeing, piece dyes, knit goods, and has had large experience on cotton skein yarns for the webbing trade, is open for a position. 38 years old; married, and an American. Will accept a reasonable salary.

FINISHERS.

1792 **Boss Finisher**, with over 20 years' experience on all kinds of woolen and worsted goods. Learned business in one of the best woolen mills in Scotland and has also had experience in some very good mills in this country. Strictly temperate and steady, and can give good references as to character and ability. Wants position in a good, steady-running mill at once. Age 38 years; married.

1887 **Overseer of Finishing** in a cotton or worsted mill, having several years' experience on cotton flannels, shirtings, blankets, crashes, cotton and worsted dress goods, and carriage cloths, is open to a position. 25 years of age; American; married, and strictly temperate. Will go to any part of the United States, except West. Best of references.

1489 **Boss Finisher**, Second hand or Boss Shearer. Well experienced; excellent references. English; age 27; single.

1716 **Finisher**. Age 29; English; married. Has worsted as wet finisher shearer, gigger, second-hand and overseer. Prefers a mill making cassimeres, worsteds, dress goods and face finished goods. A high grade of goods. Is familiar with all kinds of American and English finishing machinery, and can keep same in the best of repairs. Prefers Eastern States. Can take position at one week's notice. Best of references.

1870 **Wanted**, position as cotton finisher. American; age 48; married. Thirteen years' experience in finishing interlinings, shirtings, sheetings and cambrics, in one of the oldest and largest bleacheries in the country. Good manager of help. Can furnish reference.

DESIGNERS.

1789 **Designer**, or assistant supt. and designer. An A1 color designer. Can get up good line of fancy woolen and worsted goods which will be good sellers and profitable to the manufacturer. Graduate of a prominent designing and textile school in Germany. Is well posted on all kinds of stock, cotton and shoddy, and with the general work of a woolen mill.

1445 **Designer or Finisher**, or will take position as supt. of a small mill. German; Protestant; age 36; married. Has worked in several New England mills, and refers to them. Graduate of the Werden Textile School, Saxony. Has worked on kerseys, beavers, cassimeres, cheviots, etc. Is familiar with all makes of American and German machinery.

1838 **Designer**, assistant supt., assistant designer, overseer of weaving, secondhand large weave room, loom fixer, boss spooler, dresser, or mender. Age 48; American; single. Worked on worsteds, cassimeres, dress goods, blankets, chinchillas, cloakings, etc. All patterns of Crompton & Knowles looms, Davis & Furber spooling, dressing and weaving machinery, and Worcester warp compressor.

1888 **A German Designer**, who understands all machinery necessary for the manufacture of men's wear, woolen or worsted, is open to a position at $3000 per year. Eight years' experience in Germany and five years' in one of the largest mills in the United States. 33 years of age, and single. Best of references.

MISCELLANEOUS.

1803 **Roll Coverer.** I have done the work for a number of the largest cotton and worsted mills in this country, and am well known throughout the trade. Have been in the business 35 years, and can furnish stock and tools. Would be glad to take piece work, if shop is furnished, or would take a place by the day. Can furnish best of references.

1762 **Chemist.** Age 23; American. Wants a position in dye works, print works or bleachery. $15 a week to start on. Excellent references.

1835 **Beamer, Twister,** also understands drawing in and splitting. Age 27; American. Has worked on ginghams, dress goods, shirtings and cotton worsted.

1744 **Fixer.** Age 24; American; single. Is familiar with Boss, Invincible, McMichael & Wildman, Brinton, Denny and Victor machines. Wants $15 a week.

1851 **Machinist in Woolen Mill.** Can repair looms, cards, mules, etc., of every description, also worsted machinery. Understands forging tools and has fair knowledge of electricity. Ten years experience in some of the best mills in New England.

1845 **Fixer** or secondhand. Age 40; American; married. Worked on all kinds of spring needle work, also latch to a good extent. Gauze underwear, rubber lining, cuff knitting and ribbed hosiery.

1865 **Machinist and Fixer.** Has had eight years' experience. 24 years old; English; single. Is thoroughly familiar with Singer, Wheeler & Wilson, Merrow, Union Special, Lamb, Pepper, and Hepworth and Beattie loopers.

1873 **Master Mechanic** in cotton corporation. Has had large experience. Middle aged; strictly temperate. A graduate of a technical school. Learned carpenter's trade and machinist's.

1866 **Overseer of Burling** and Sewing of Cloth Examiner in commission house. Have had 25 years' experience in the cloth room and can handle any class of woolens or worsteds, either dress goods or men's wear. 41 years old; Irish; married. Best of references. Have a son 19 years old who is a percher and brusher.

1881 **Paymaster or Bookkeeper.** Agent or Manager Wood or Iron working plant or small cotton mill. 28 years' experience. Expert accountant. Can take charge of all the office work in large factory or do all myself in small factory. Good references. Will go anywhere in New England or Middle States.

1704 **Boss Dyer.** Age 36; English; single. Is familiar with dyeing cotton yarn and warp both for bleaching, fulling and other purposes. Has dyed for the best firms in England, also for export work.

1810 **Dresser Tender.** Age 23; German, single. Is familiar with Davis & Furber and Cleveland dressers. Will not change for less than 20 cts. per hour.

1885 **Chief Engineer,** or master mechanic; 20 years' experience in large Massachusetts and New Hampshire cotton mills, is open to a position in any part of the United States. 39 years old; married, and an American. Understands all modern makes of motive machinery, including engines, boilers, pumps, electrical machinery, etc. Good references.

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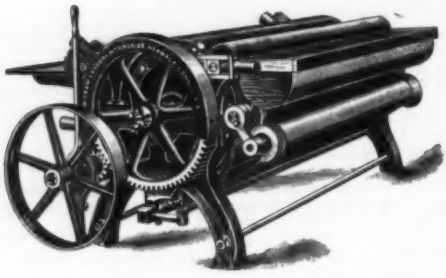

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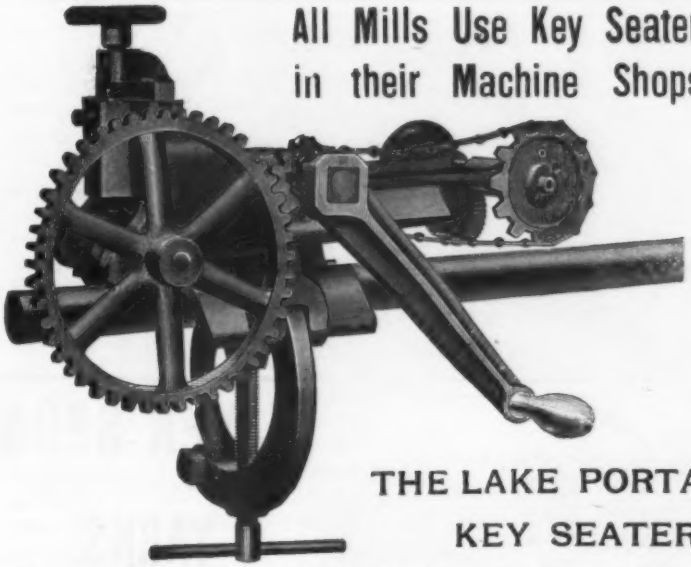

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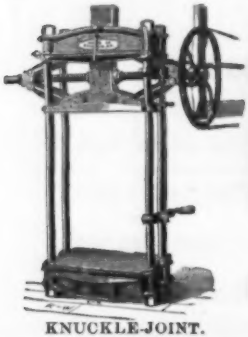
Will enable you to cut Key Seats on any size Shafting during the noon hour, and without removing the shafting from the hangers. Write for particulars.

The John Leisenring Mfg. Co., Ltd.

Belmont and Elm Avenues, Philadelphia, Pa.



KNUCKLE-JOINT.

BOOMER & BOSCHERT

BALING PRESSES

ARE THE STANDARD.

Boomer & Boschert Press Co.

338 West Water St., SYRACUSE, N. Y.

HYDRAULIC

EASTON AND BURNHAM MACHINE CO.,

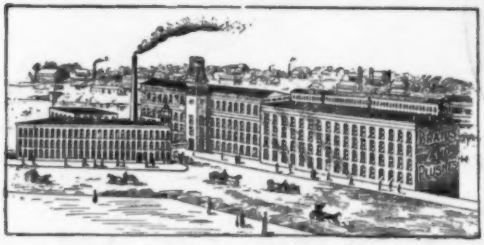
Pawtucket, R.I.

ALL KINDS OF Spindles

USED IN THE MANUFACTURE OF COTTON, WOOL & SILK

IMPROVED UPRIGHT SPOOLERS

TO SPOOL FROM COP, SKEIN, OR BOBBIN.



FLYER SPUN

Mohair and Worsted

YARNS.

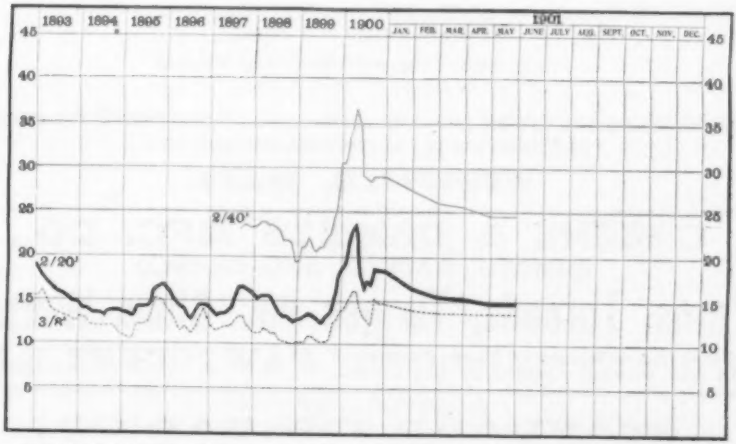
Mohair Plushes,

Worsted and Cotton Braids.

D. COFF & SONS, Pawtucket, R. I.

ESTABLISHED 1861.

YARN DEPARTMENT.



GRAPHIC CHART SHOWING RANGE OF PRICE OF COTTON YARN TO DATE.

Cotton Yarn.

The situation in the cotton yarn market is practically unchanged, and the monotonous reports which we have been compelled to make for several months of large stocks and slight demand are still unfortunately true.

The buyers of cotton yarn have not been able to secure any increased business for their knit and woolen products, consequently they have purchased yarn in small quantities. Their knitting frames and looms are to a considerable extent idle, and they find large stocks of yarn on hand. Under such conditions prices continue depressed, and there are no signs of any immediate improvement. The curtailment of production by cotton yarn spinners has prevented matters from being worse than they are now, but has failed to put the business on a healthy basis.

Radical measures in the way of the reduction of working time in the cotton yarn mills are necessary. Today the buyer has the advantage, and will continue to have it as long as large stocks of yarn remain on hand. In certain cases where knitters and weavers require yarn that is not in stock they are compelled to pay full prices, but it is seldom that the buyer cannot find stock already spun to meet his requirements.

The trade is passing through a period which is the direct result of over speculation on the part of all hands including cotton dealers, spinners, weavers, knitters, and dealers in goods. How long the process of readjustment will continue is a problem. There are only two remedies to which it is hardly necessary to call the attention of the trade, viz., increased demand, or decreased production. We quote as follows:

14/1	12¾ to 13
16/1	13¼ to 13½
20/1	13½ to 13¾
22s	13¾ to 14
26s	14 to 14¼
14/2	13 to 13½
16/2	13¼ to 14
20/2	13¾ to 14
24s	14¼
30/2	15 to 15½
40/2	22 to 23

W. Warren Thread Works,

SPOOL COTTON
on 100 to 12,000 yd. Spools or Tubes.

A Specialty of Thread for Manufacturers Use
on Spools, Tubes or Bobbins.

Also Seaming and Hosiery Yarns
on Cones, Tubes or Skein.

Our bleaching and dyeing facilities are new and unsurpassed for prompt and neat work. Correspondence solicited.

WESTFIELD, MASS.

GREENE & DANIELS MFG. CO.,

COMBED, CARDED AND GASSED

Yarns, Threads, Twines and Chain Warps,

Colored and Bleached Yarns Furnished in any manner desired by the trade. **PAWTUCKET, R.I.**

INCORPORATED 1884.

STANDARD THREAD CO.,

Manufacturers of

SPOOL COTTON

For the Manufacturing Trade.

NEW YORK CITY.

BARNESVILLE MFG. CO.

BARNESVILLE, GA.

HOSIERY AND UNDERWEAR YARNS,
Peeler, Bleached, Egyptian or any colors desired. Also,

FINISHERS AND BLEACHERS
of piece goods, underwear, towels, yarns, etc.

THE ONLY USERS OF JACKSON'S FORMULA OXIDIZED BLACK FOR HOSIERY.

We solicit your patronage. Work Guaranteed.

NEW YORK OFFICE and SALESROOM. 910 N. Y. Life Bldg., N. Y.

INDIAN ORCHARD COMPANY,

Indian Orchard, Mass.

Manufacturers of - - - -

COTTON WARPS AND YARNS
In gray and all colors, single or in any twist.

NOVELTY YARNS
In Cotton, Mercerized Cotton, Silk and Worsted, in various Patterns, Colors and Twists.

We are always pleased to assist our patrons of the Woolen Goods manufacture in special pattern warps for samples.

Carded and Colored Cotton for Mixing With Wool

Machined, or in Roving.

Philadelphia Yarn Market.

The conditions of business have not improved particularly for spinners, although there has been larger movements of yarn the past month than previously. It would probably be impossible for a spinner of carded yarn to sell anything today at a profit. There are some yarns in the market, which always sell at lower rates than others, but their prices have been used recently to depress the prices of the best grades, as well. All spinners have felt the pressure of such stocks in the market. The only remedy seems to be now, either decreased production, or an increased demand.

The decreased production certainly must come, unless prices advance, as spinners cannot afford to make yarn, when present stocks of cotton are exhausted. This abnormal condition of trade has largely been brought about by the gamblers in the cotton exchanges, who are able to depress and elevate the market at will by selling what they do not own and buying what no one else owns.

These speculators can make money each season at the expense of the manufacturers, who are not able to manipulate the markets.

The following quotations are close to the prices at which the yarn can be bought today.

Southern Frame Cones,—

6s 8s	13 to 14
10s and 11s	14
12s and 14s	14¼ to 14½
16s	14½ to 15
18s	15
20s	15 to 15
22s	15½ to 16
24s	16 to 16½
30s	17½ to 18
40s	24 to 25
50s	31 to 32

Fairly good mule yarn, basis 10s cones at 15c. Rise ¼c. per number.

14s	16
18s	16½ to 17
20s	17 to 17½

New England Cotton Yarn Co.

NEW BEDFORD, MASS.

JAMES E. STANTON, Jr., Agent.

Branch Offices:

ALBANY: 38 State Street. . . . . E. A. VAUGHN, Manager.
BOSTON: 77 Bedford Street . . . . . J. B. JAMIESON, Manager.
NEW YORK: 346 Broadway . . . . . P. H. CORR, Manager.
PHILADELPHIA: 213 Chestnut Street . . . P. H. CORR, Manager.

Mule Spun Hosiery Yarns, Carded and Combed.

Colored Yarns, Solid, Mixes and Randoms.

Spinners of Cotton Yarn

Frame Yarns, Single and Twisted, Carded—Combed—Bleached

Fine Yarns, For Electrical Purposes

All Numbers 4 to 200.

From

American Peelers, Sea Island, Peruvian and Egyptian Cotton.

BENNETT, HOWLAND, ROTCH, N. B. SPINNING, COHANNET, NEMASKET, GLOBE, SANFORD, } **650,000 Spindles.**

Entire product sold direct to consumers through the Company's own offices.

CAPACITY, 50,000 Spindles.

ORSWELL MILLS

FITCHBURG MASS.

COMBED OR CARDED

COTTON YARNS

In Chains and Skeins, on Balls, Beams, Spools—single or twisted.

WILLIAM FIRTH, PRESIDENT. FRANK B. COMINS, TREASURER

AMERICAN MOISTENING COMPANY,

150 Devonshire St., Boston, Mass.

The "Drosophore" and "Vortex" Humidifiers.

Over 20,000 of our HUMIDIFIERS in operation.

Highest award on the Recommendation of The FRANKLIN INSTITUTE for

"SIMPLICITY and ORIGINALITY of DESIGN"

DANA WARP MILLS

Westbrook, Maine.

WHITE AND COLORED WARPS,

6s to 50s—Single and Ply.

MULE COPS,

from 30s to 50s from

AMERICAN AND EGYPTIAN COTTON.

The J. R. MONTGOMERY CO.,

WINDSOR LOCKS, CONN.

Manufacturers of

Mercerized Cotton Yarns. GIVES THE HIGH SILK-LIKE LUSTRE IN KNIT GOODS AND WOVEN FABRICS

Novelty Yarns. BOUCLE, BOURETTE AND SPIRALS, IN COTTON, WOOL WORSTED, MOHAIR AND SILK.

Cotton Warps. ON BEAMS, JACK SPOOLS AND TUBES. IN FANCY TWIST COLORS AND PRINTED.

Woolen Yarn.

Trade is irregular. At one time spinners have more business than can well be attended to, and then a dull period is experienced. The business going is varied and divided between overcoating manufacturers, men's wear weavers, hosiery manufacturers and underwear knitters.

The rubber boot trade is flat and no yarn is being made for this class of trade. The hosiery business is just beginning, but the orders are very backward and knitters hardly know what their requirements are to be. Some of the knitters state that they depend on the duplicate business to carry them through.

The underwear business is certainly dull. The orders have been coming forward slowly, and a late business will result; knitters state that it is impossible to force business and all that can be done is to let buyers take their time and buy when they are ready, although how the goods are to be delivered on time is beyond conjecture.

In ordering stock knitters will take no chances; even where the stock must come from Europe, knitters will only order sparingly. The stock which is most largely imported is thread waste; much of this is being sold at prices ranging from 55 to 61 cts. per pound. Natural black tops are being sold to make certain fabrics. Certain salesmen are so anxious to sell that they seem willing to take orders without considering where the material is to come from. Certain ones are willing to take orders for 10,000 lbs. of this sheep's grey yarn for immediate delivery, when as a matter of fact the black wool market is cornered by certain dealers, and 500 lbs. would be more than could be sold, and it is doubtful if that amount could be furnished. This state of affairs will exist until September.

The wool clip is late, and dealers have been buying the new wool in the West at prices which it cannot be sold for in the East. The dealers have been getting frightened at the present state of affairs, and have telegraphed

CATLIN & CO.,
YARNS.
67 Chauncy St., Boston
210 Church St., New York.
306 Chestnut St., Philadelphia.

Walcott & Campbell Spinning Co.
FANCY HOSIERY YARNS
IN ALL COLORS.
New York Mills, Oneida Co., - N. Y.

JAMES E. MITCHELL & CO.,
COMMISSION MERCHANTS.
COTTON YARNS
For All Purposes.
122 & 124 Chestnut St., PHILADELPHIA. 74-76-78 Summer St., BOSTON.
SOLE AGENTS FOR
Lawton Spinning Co., - Providence, R. I.

TUCKER & COOK MFG. CO
MANUFACTURERS OF
WHITE AND COLORED COTTON WARPS
Nos. 6s to 30s,
On Beams, Jack Spools or in Chain
CONWAY, MASS.

GRANT YARN CO.,
COMBED AND CARDED COTTON.
YARNS 40s and above. AND
FITCHBURG, MASS. WARPS

COTTON, WORSTED, WOOLEN, MERINO AND FRENCH SPUN YARNS
Mercerized Cotton a Specialty
Write for Samples.
E. A. MORGAN,
54-66 Franklin St., N. Y. City

LINEN YARN IMPORTER.
Hughes Fawcett, 115 Franklin St., New York,
Flax, Hemp & Jute Line and Tow Yarns,
FOR WEAVING PURPOSES
Linen Jacquard Harness Twines.
Fine Cotton Harness and Heddle Twines.
For Cotton, Silk, Woolen and Carpet manufacturers. Correspondence solicited. Samples promptly furnished.

TRY OUR
SILKINE Also LISLE SILK FINISH
For Hosiery, Knit Goods, Yarn, Fast Black and Bleached Goods
O. K. SOAP CO., 968 Franklin St., PHILA.

HOWLAND CROFT, SONS & CO.

LINDEN WORSTED MILLS.

Fine Worsted Yarns

OFFICE AND MILLS:

Broadway and Jefferson Ave., Camden, N. J.

Represented by FIRTH BROADHEAD,
937 Banigan Building, Providence, R. I.

ALLEGHENY WORSTED MILLS,

Thomas Wolstenholme, Sons & Co., MANFRS. OF

Worsted YARNS,

ALL NUMBERS SINGLE AND TWO-PLY,

Sell Direct,

on Cop or in Skein, for Weaving and Knitting Purposes, in White, Natural & Fancy Mixes

Office and Mills: Frankford Ave. and Westmoreland St., Phila., Pa.

CRANSTON WORSTED MILLS.

Worsted and Mohair Yarns—white or colors, in skeins, on spools, cones, or shuttle bobbins.

NOVELTY YARNS—of Mohair and Worsted. We are the only manufacturers in the United States making these yarns from the raw material to finished product and making Yarns **only.**

CENAPPED YARNS of all kinds. Doup Yarns. Harness Yarns. For Braids, etc.

...Dyers of Yarn and Slubbing...

BRISTOL, R. I.

FRENCH SYSTEM. BRADFORD SYSTEM

B. F. BOYER CO.,

MANUFACTURERS OF

Worsted and Woolen Yarns

OFFICE AND MILL: Delaware and Cooper Streets. **CAMDEN, N. J.**

C. MOORE & CO.,

MANUFACTURERS OF

TWINES, THREADS AND YARNS.

Jacquard Harness Twines of all kinds on hand and made to order.

S.W. COR. FIFTH & MARKET STS.,
Philadelphia.

RICHARD CAMPION,

Selling Agent for—

Bristol Worsted Mills,
Highland Worsted Mills.

17 Bank Street, Philadelphia, Pa.

MALCOLM MILLS CO.,

MANUFACTURERS OF

Novelty Yarns, Silk Noil Yarns, in Fast Colors AND White.

Mills, Frankford, Pa. Office, 229 CHESTNUT ST., PHILA.

their men to go slow and make few purchases until prices are lowered.

On the other hand the West has plenty of money and can hold their wool and, as no wool can be imported if a demand for goods starts in, prices for wool will advance. The result of all this will be a deadlock between the dealers and wool growers, and a very late wool clip, all the way from 3 to 6 months late.

Speculation has certainly played a sorry part in the Boston wool market. We hear of an instance where a woolen manufacturer purchased a lot of wool just before the boom at 16 cts. from a dealer who had purchased it at 12½ cts. This wool advanced to 22c. at which price the manufacturer could have sold at a profit of $90,000. He wanted 24 cts. and he still owns the wool, which now shows a loss of $50,000; this is but one instance out of many.

At the recent London sale 181,000 bales were offered in 14 days (30 April 15 May) and 170,000 bales were sold. There will be 35,000 bales held over for next series, July 2d. The sales continue well attended and prices on Merinos are quoted 5 to 7 per cent. higher.

Worsted Yarn.

Prices are low, but wool is also low, and each time the spinner purchases wool he buys for less money. This unfortunately applies only to those spinners who are not working off old

J. BROADBENT & SONS,
Woolen Yarns
for Knitting and Weaving, also Wool Spun Cotton Yarns. Equipment first class, practical experience, small expenses, and low prices. Will take work on commission.
UNIONVILLE, CONN.

J. S. DODDS,
517 Wool Exchange, New York, N. Y
MERCERIZED YARNS
Two and Three Ply, for All Purposes,
In Peeler, Egyptian and Sea Island, gassed and ungassed, natural and dyed. Fast Black for cross dyeing a specialty.
Through H. A. CAESAR & CO.

EICHMANN & STERNBERG
530 Broadway cor. Spring St., NEW YORK.
Mercerized, Turkey Red, Gassed } Cotton Yarns.
Jacquard and Harness Twines.

Buckingham, Paulson & Co.,
COMMISSION MERCHANTS.
COTTON YARNS of all Descriptions.
83 Leonard St., New York.
120 Chestnut Street, Phila. 530 5th Ave., Chicago. Ills
Cash Advances, Cash Sales and Prompt Returns. Consignments and correspondence solicited,

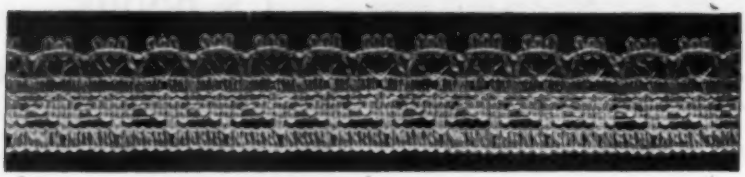
E. JENCKES MFG. CO.
Colored Cotton Hosiery Yarns, Double and Twist Yarns for the Weaving Trade.
PAWTUCKET, - R. I.

DEXTER YARN CO.
Cotton Yarns in Cops, Cones and Skeins; on Beams or Spools, Single and Twisted. Cable Cords and Twines.
PAWTUCKET, - R. I.

A. D. SALKELD & BRO.
With
FRED'K VIETOR & ACHELIS.
YARNS,
66-72 LEONARD ST., NEW YORK.

Eddy & Street,
COTTON, WOOLEN, **YARNS** AND **BRAIDS** WORSTED, SPUN SILK.
PROVIDENCE, R. I.

DAN'L MASON,
Voorhis Mills, PATERSON, N. J.
BUYS JOB LOTS in colored and raw SILK YARNS.
Cash Advances on Sales and Prompt Returns.



LACE EDGINGS AND BRAIDS

... FOR ...

KNIT UNDERWEAR

It will pay you to see our

SAMPLES for SPRING 1902

and get our prices before placing your season's orders.

With our increased capacity

PROMPT DELIVERIES ARE ASSURED AT LOWEST PRICES.

G. A. Schneebeli & Co.

NAZARETH, PA.

GEORGE W. CHAPIN, 229 Church St., Philadelphia,
SELLING AGENT.

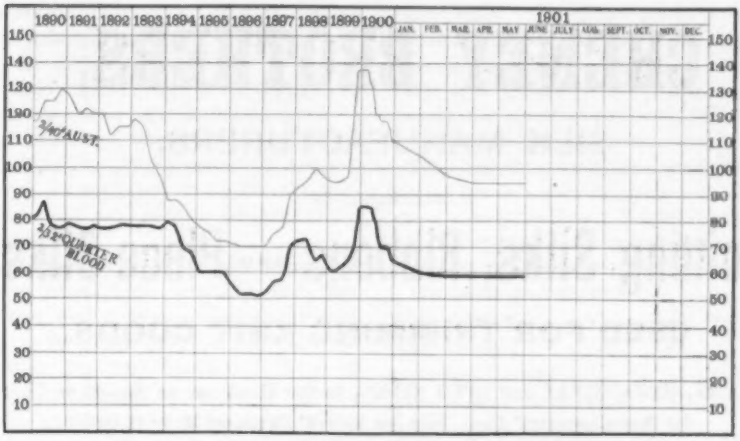


CHART SHOWING RANGES OF PRICE OF WORSTED YARN.

wool purchased at high prices, and to those who have stock yarn which they are trying to sell.

When a spinner has a certain size or grade of yarn on hand the customer generally wants a grade or size different from what the spinner has to sell. We know of spinners with stock yarn who are offering it at a loss of 20 or 30 cts. per pound and can get no one to take hold of it. One spinner we know of declined an order of 25,000 pounds, accepting only 5000 pounds of the order. He made 2000 lbs. more than the 5000 lbs. ordered. Before the 5000 lbs. was finished the price advanced 25 cts. per pound, but he sold no yarn at this price, and today this spinner is trying hard to get rid of the 2000 lbs. at a loss of 20 cts. per pound from the price at which he could have sold his 25,000 lbs.

The business among the weavers of men's wear worsted trade is very irregular. Some mills are running full, while others have but few orders. The Clay piece dye business is the best, and to this add the mills who early in the season distributed their samples well. The sample pieces should have been on the market last December, but it was not before March that any were ordered forward. Manufacturers are now busy getting

SILK NOILS AND SILK NOIL YARNS
IN WHITE AND COLORS.
MOHAIR LOOPS, KNOTS, AND FANCY YARNS FOR DRESS GOODS AND CLOAKINGS.
A. T. SKERRY & CO., 47 LEONARD ST., NEW YORK.

WEIMAR BROS., MANUFACTURERS OF
Silk, Cotton, Medium and Superfine, and Non-Elastic
BINDINGS.
Medium and Superfine Tapes a Specialty.
2046 Amber St., Philadelphia.

F. C. BARTON,
Manufacturer of
Narrow Fabrics, Ribbons, Tapes and Bindings
FOR THE MANUFACTURING TRADE.
Telephone, 2320 Franklin. 54-56 Franklin St., NEW YORK.

CHENEY BROTHERS,

SILK MANUFACTURERS.

ALL KINDS OF

Knitting Silks, Ribbons AND Piece Silks,

USED FOR TRIMMING KNIT GOODS.

TRAMS, ORGANZINES and SPUN SILKS, in the Hank, or on Spools or Cones, for Manufacturers' Use. Silk for Special Purposes Made to Order.

MILLS: South Manchester and Hartford, Conn.

SALESROOMS: 477, 479 and 481 Broome Street, NEW YORK.
929 Chestnut St., PHILADELPHIA.
79 Chauncy Street, BOSTON.
186 Franklin Street, CHICAGO.

WILLIAM RYLE & CO.,

DEALERS IN

Domestic Thrown Silk of every description. Fine Pure Dye Silks for the woolen trade a specialty. Foreign and domestic

SPUN SILK YARNS AND NOILS

Importers of European and Asiatic Raw Silk.

54 Howard St., cor. Mercer St., - NEW YORK.

MONUMENT MILLS,

Manufacturers of

White, Colored, Fancy and Double and Twist, **COTTON WARPS**

HOUSATONIC, MASS. 4s to 60s.

COTTON YARNS

from 2s to 26s single and ply.
SPECIALTY—FIRE HOSE CORD and YARNS put up on tubes wound on Universal System.

WHITTIER MILLS, - - - - - SPRINGFIELD, MASS.

WE ARE DYERS OF ALL KINDS OF YARNS AND COTTON WARPS.

We are sure we can give you better work and better service then you can get elsewhere
A trial will convince.

T. BROPHY'S SONS, Jasper St., above Clearfield St., PHILA., PA.

these out, and on top of this, buyers are ordering duplicates in a great hurry for delivery.

Cheviots and serges are going out and manufacturers are swinging over to the undressed worsted finish so much in demand. Fancy worsteds are not doing so well, but the mills are running, and are getting further duplicates.

Some of the weaving mills up to this time have been securing but few orders, and it is our observation that the mills selling direct to the trade are getting the best business. Some of the weavers are ordering yarn each day, while others have their orders placed, and will not be on the market again before July.

The spinners of French spun yarn are securing but few orders from the knitters of hosiery, as the duplicate business has not yet started in, and the early business is running out. The weavers, however, are placing some orders with the spinners of French spun yarn. The dress goods manufacturers are doing a fairly good business and are buying yarn, but at very low prices. The yarns used mostly for dress goods are 2/36s for which 60 cts. is being paid.

The combers are getting some orders, but at prices which in most instances show a positive loss. We believe the season for yarn is going to be late, but that a good business will be secured.

We quote as follows:—

2/40s Australian,	85	to 90
2/40s Delaine,	85	
2/40s half blood,	76	to 80
2/30s quarter to ⅜ blood,	60	
2/36s quarter blood,	60	
1/40s half-blood, French spun	75	
1/30s half blood, French spun,	70	

—The American Bridge Company will furnish to the Illinois Central R. R. Company all of the bridge work required on this railway during 1901. About 3000 tons of steel will be used.

Telephone Connection.

KROUT & FITE MFG. CO.,

Manufacturers of

SILK and COTTON NARROW FABRICS

Spool Tapes a Specialty.

Office and Mill, Allegheny Ave. and Emerald St., PHILADELPHIA.

Pawtucket Dyeing & Bleaching Co., BLEACHERS AND DYERS OF

COTTON YARNS AND STOCKINET.

OFFICE WITH BLODGETT & ORSWELL CO., Manufacturers of Glazed Yarns,

232 FRONT ST., PAWTUCKET, R. I.

HOME BLEACH AND DYE WORKS,

PETER B. McMANUS, Proprietor.

Dyers and Bleachers of Cotton Yarns,

PAWTUCKET, R. I.

DAVIDSON & BROOKE, ORIANNA BLEACH WORKS.

BLEACHERS

Of Turkish Towels, Cotton Yarns, Underwear, Tapes and Hosiery.

Turkish Towels made up to suit the trade and shipped to any point.

2560 No. 3rd St., PHILADELPHIA.

Correspondence solicited.

UNITED STATES FINISHING CO.

FINISHERS OF

COTTON FABRICS.

320 Broadway, New York City.

WORKS AT

NORWICH, CONN. PASSAIC, N. J. PAWTUCKET, R. I.

OWNERS OF

THE STERLING Dyeing & Finishing Co.'s Fast Black Plant

AT STERLING, CONN.

—Russia is one of the few states, writes the U. S. Consul at Frankfort, which put a duty on imported cotton, and this is heavier than that levied in most countries, being equivalent to almost $5 per 110 pounds, and amounts to about two-thirds of the value of the staple. Owing to this tax, the importation of cotton diminished by nearly 72,000,000 pounds in 1899, while the production of raw cotton in Russian central Asia increased 34 per cent. in the same year, 877,521,600 pounds being raised. Grain fields in that territory are now planted with cotton, as the cultivation of the fibre is much more profitable than that of wheat. Russia, it may be expected, will soon supply her own needs in cotton.

—The American Bridge Company will furnish to R. H. Hood & Company, the structural steel for the N. Y. Central pier shed to be built on Pier No. 59, North River. This will require over 1000 tons of steel work.

—B. B. & R. Knight have purchased a Green Economizer for their recently acquired Nottingham Mill, Providence, R. I.

Mercerizing Cotton Velvet.

A process has recently been patented in Germany for mercerizing cotton velvet before cutting. The patentee states that all efforts to mercerize the velvet after cutting have thus far proved failures. By this process the woven goods are saturated with the alkali solution ordinarily used for mercerizing, and then dried, either under tension or pressure. He claims that a lustre equal to silk is obtained, that the goods resemble silk velvets and that this lustre stands scouring and exposure to rain.

—The American Blower Co., of Detroit, Mich., find it difficult to keep abreast of their orders. One of the features of its business to which this company gives special attention is that of handling special drying problems. They have recently sold dryers for powder, rubber, pulp plaster, second-hand bags, curd, tobacco and eggs—products differing sufficiently to prove their ability to cope with anything which may be presented in this line.

—H. G. McKerrow & Company, Boston, Mass., have the following orders for Tweedales & Smalley's machinery, recently received: Walcott & Campbell Spinning Company, Utica, N. Y., roving frames; Norris Cotton Mills, Cateechee, S. C., card room equipment; William Clark Company, Westerly, R. I., cards; Smithfield Cotton Mills, Smithfield, N. C., card room equipment.

FIRTH & FOSTER CO.,

Dyers and Finishers of

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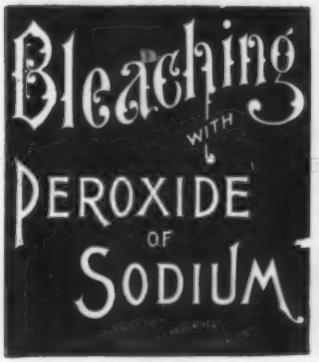

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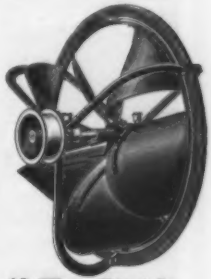

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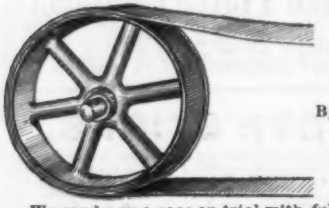

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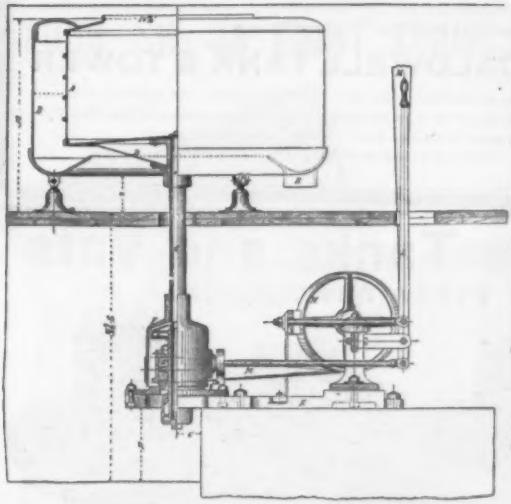

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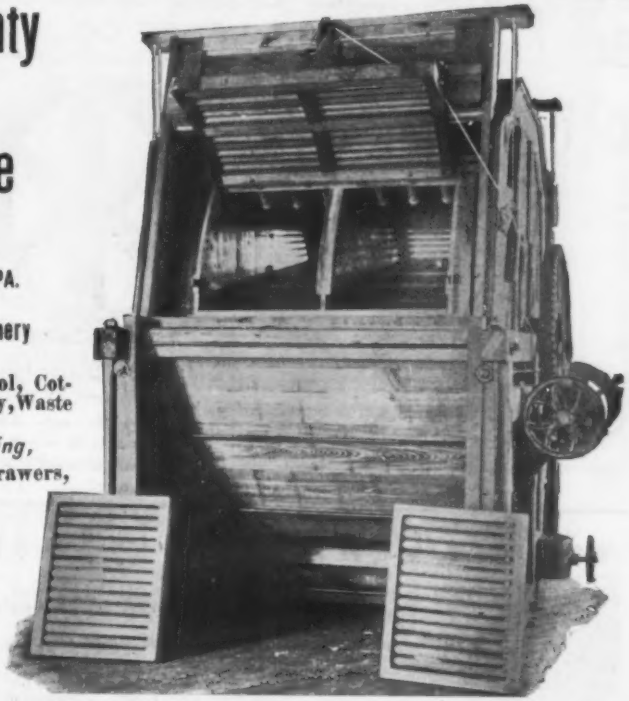

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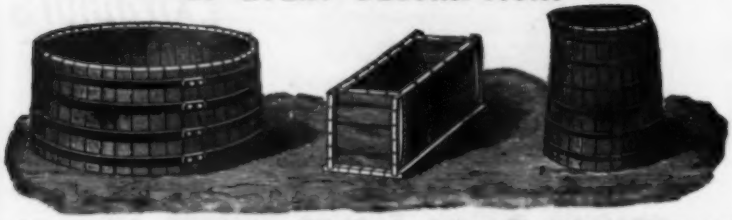

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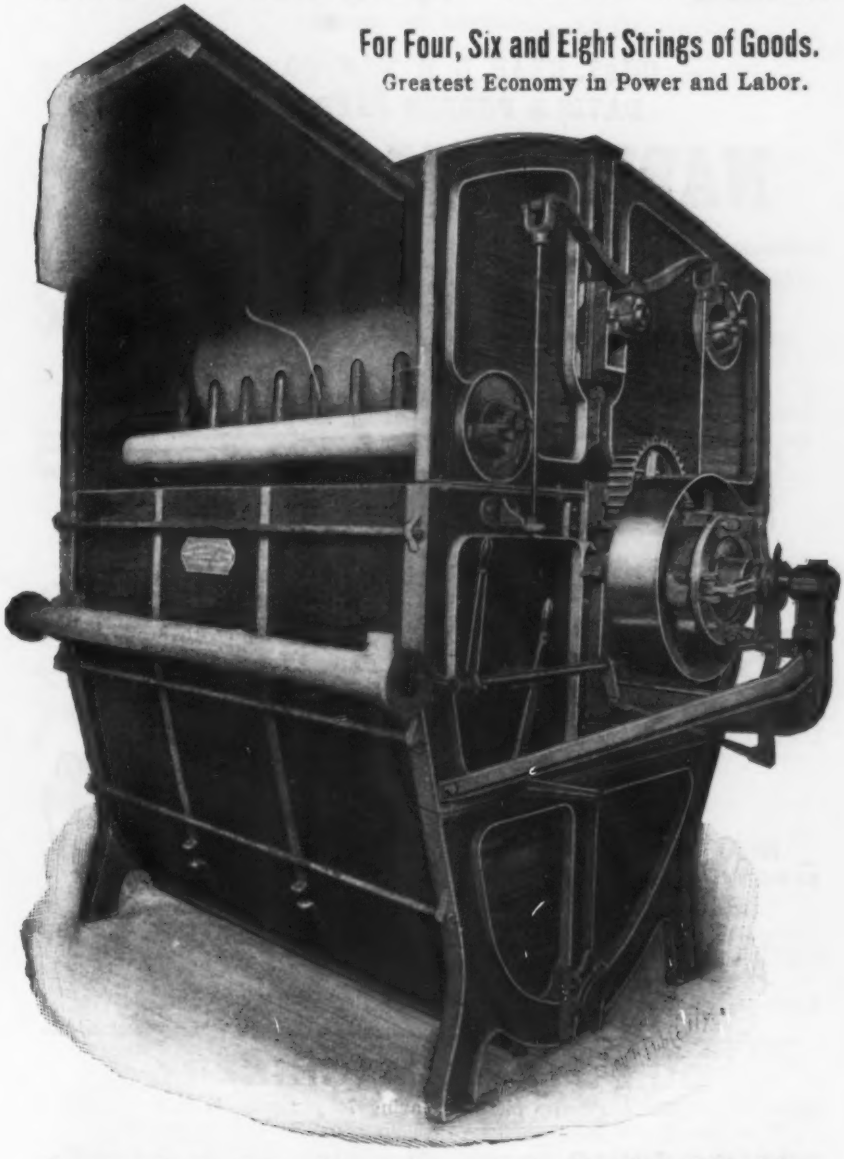

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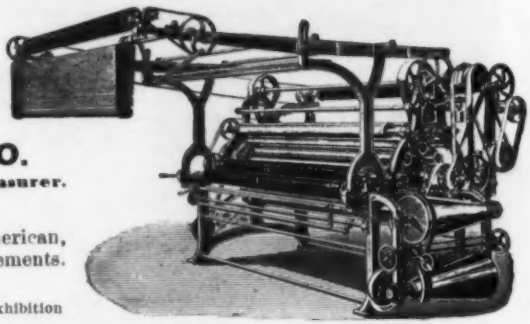

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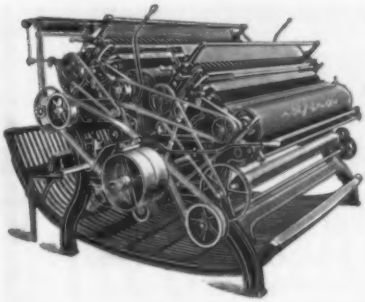

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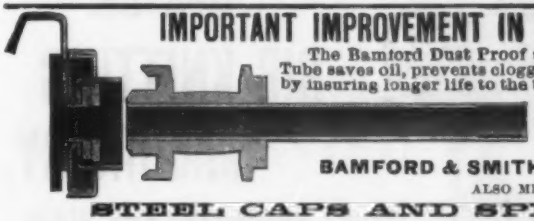

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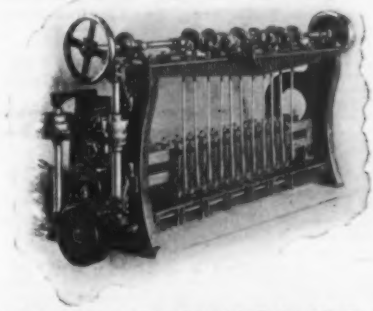

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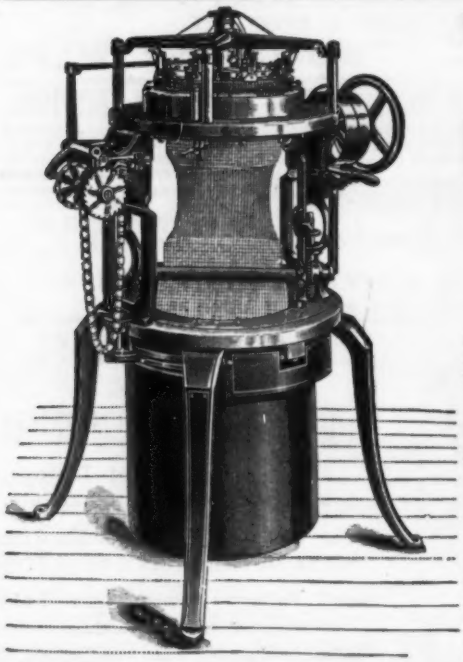

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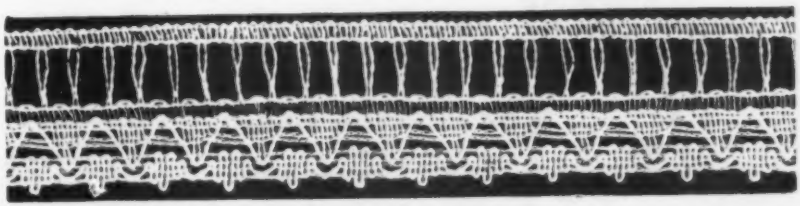

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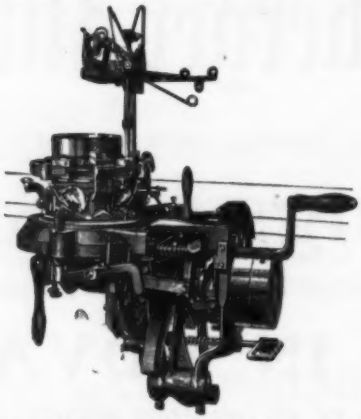

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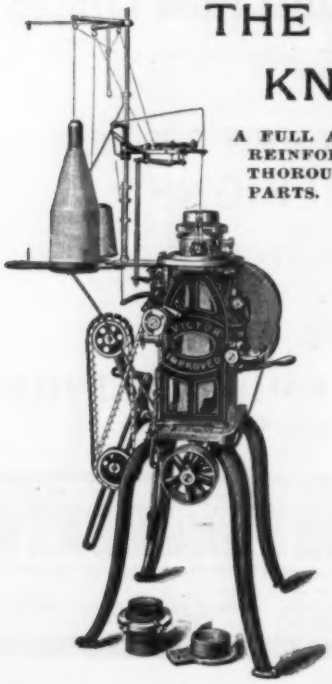

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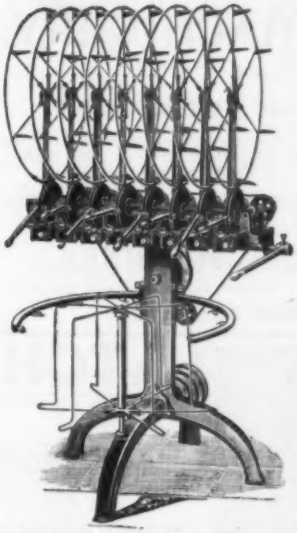

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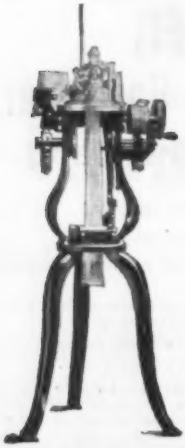

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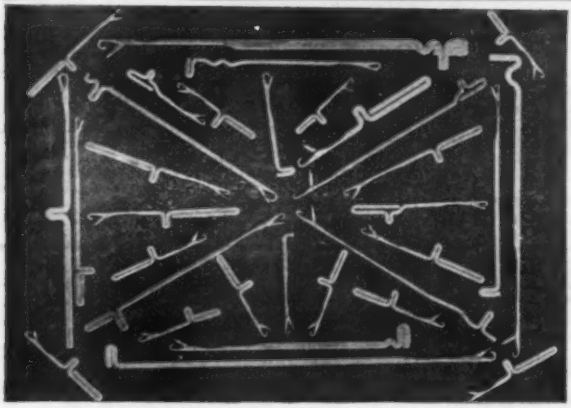

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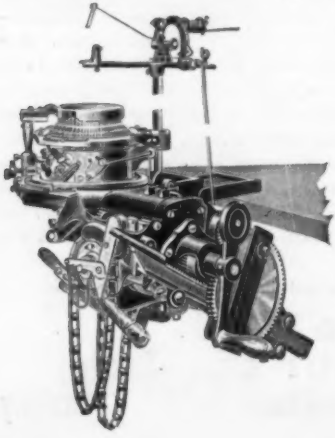

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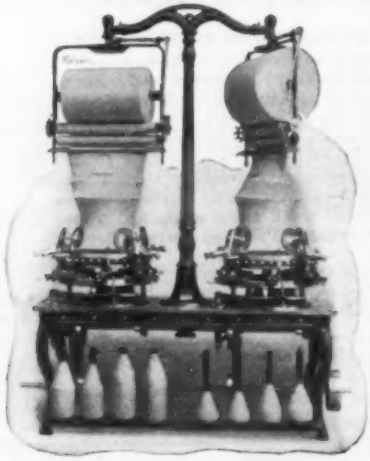

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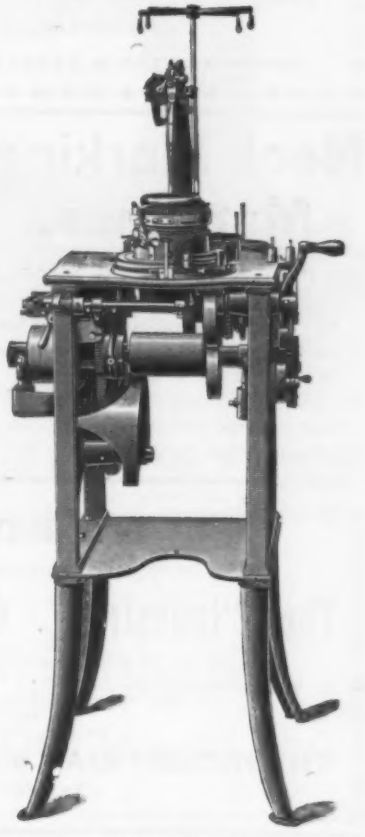

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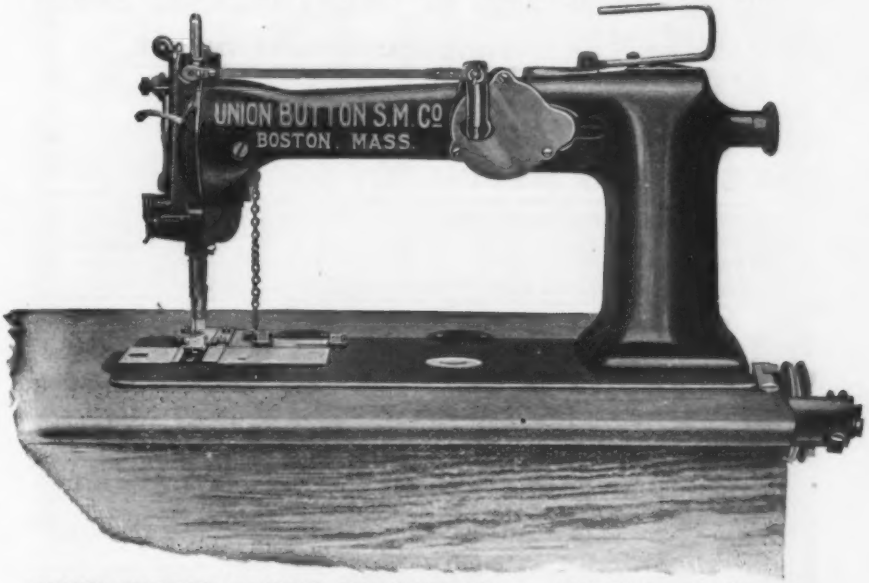

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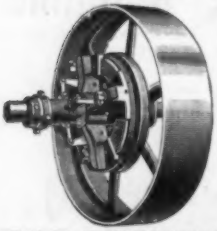

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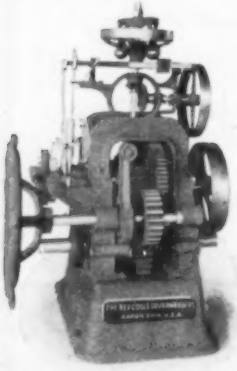

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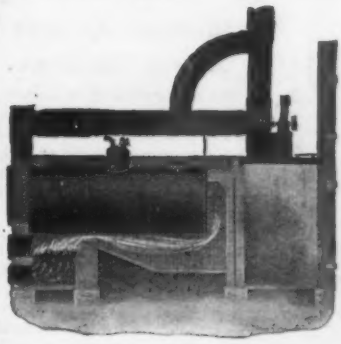

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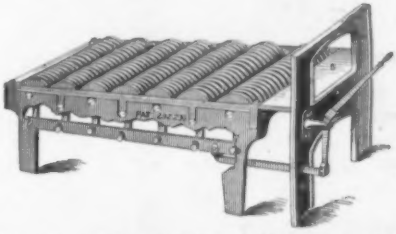

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Especially adapted for use in Repair Shops. Now in use in **Three Hundred** representative mills, including **Twenty-four** in Fall River, Mass. On application, we shall be glad to submit full particulars, prices, and photographs of the latest improvements. Send for our **1900 Pamphlet**.

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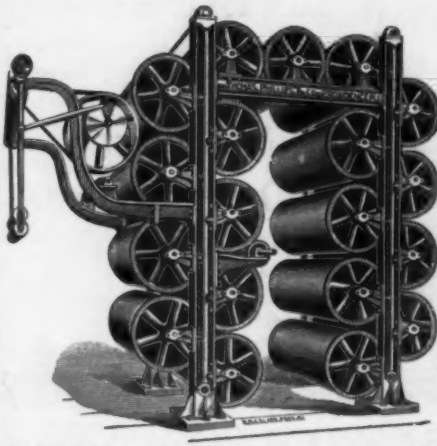

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The cut shows a 19-can machine with two tiers with intermediate can for continuous drying. We build any arrangement of stringing and furnish any desired number of cans, of any length, either with Phillips Steel Head or Cast Iron. We strongly advise our Steel Head Can. It is a big improvement as eight years' experience has demonstrated. This upright machine enables cloth to run without wide intermediate spaces between the tiers, as in horizontal machine, thus avoiding "scrimps." We also build Horizontal Frames, but on radically different principles from most others. Our illustrated catalogue explains all these points at length and has many plates showing different styles of stringing. It may be had for the asking.

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Summer Ventilation

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Capacities from 2,000 to 175,000 cubic feet per minute.
Driven by belt or direct connected electric motor.

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